THE ROYAL ENGINEERS JOURNAL.

Vol. X. No. 4. OCTOBER, 1909.

CONTENTS.

INSTITUTION OF RE OFFICE COPY

DO NOT REMOVE

122

THE MODERN ROOFING MATERIAL,

"ETERNIT."

ROOFING SLATES.

SHEETS FOR WALLS AND CEILINGS.

INDESTRUCTIBLE, LIGHT, ARTISTIC, ECONOMICAL, WEATHERPROOF.

Weight, 22 lbs. Laid.

G. R. SPEAKER & CO.,

Engineers & Contractors to H.M. Government,

29, MINCING LANE, E.C.

WIRE—"ETRASHEET." 'PHONE—CENTRAL 13174.

HAWKES & CO., LTD.,

TAILORS AND MILITARY OUTFITTERS, CAP AND ACCOUTREMENT MANUFACTURERS,

14, PICCADILLY, LONDON.

Patronized by many Officers of the Royal Engineers.

Telephone No.—East 53. Telegraphic Address:—"Constructive Ironworks, London."

MATTW. T. SHAW & CO., Ltd.,

MILLWALL, LONDON, E.

CONSTRUCTIONAL STEELWORK,
FRAMED BUILDINGS, BRIDGES, ROOFS, Etc.

Large Stocks of Joists, Channels, Angles, Tees, Flats, Plates, Chequers, Rounds, Squares, Rivets, Bolts, Galvanized Sheets, etc., etc.

VERY PROMPT DELIVERIES GUARANTEED.

Telegrams—"GUNDRADA, LONDON." Telephone—4716 Gerrard.

THE ARMY, NAVY AND GENERAL ASSURANCE ASSOCIATION, LIMITED.
HEAD OFFICE: 217, PICCADILLY (CIRCUS), LONDON, W.

Fire, Theft and Burglary *(Combined)*.

Chargers, Hunters, Marine Risks.

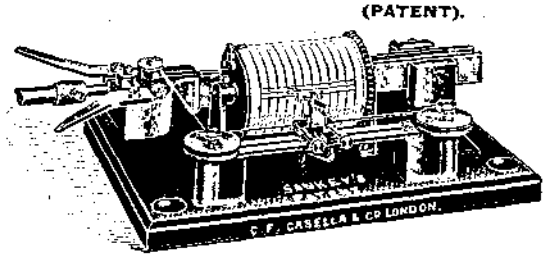
The "Professional" Policy
. of .
Accident and Disease Insurance

Is Specially adapted for Military and Naval Officers serving in ANY PART of the WORLD, and now covers 30 Specified Diseases.

Revised Prospectus of Extended Benefits on application—

217, PICCADILLY (CIRCUS), LONDON, W.

CAPT. SANKEY'S METAL-TESTING MACHINE.
(PATENT).



This machine acts on the bending principle and requires only a small and easily-prepared testpiece, from which in a few seconds a record may be obtained giving all the data for determining the quality of the material.

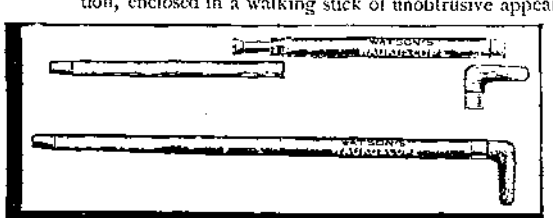
The machine is inexpensive, and may be operated by unskilled labour, as the personal element is removed. Automatic records of each test are obtained, which may be filed for reference.

Pamphlet and full particulars from the sole makers:

C. F. CASELLA & CO., 11-15, Rochester Row, London, S.W.

The Walking Stick that is a Telescope.

Watson's "Waukoscope" is a handy combination of a Telescope of great power and definition, enclosed in a walking stick of unobtrusive appearance and light weight.



THE "WAUKOSCOPE"
(Patented and Registered).

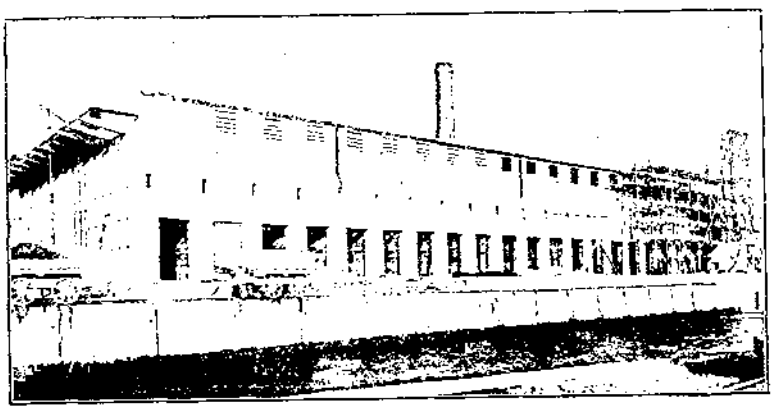
The "Waukoscope" has a handle at the top, which on being removed exposes the telescope object glass. The lower half screws off, and leaves the eyepiece of the instrument ready for extending for use.

Price, 35/-.

W. WATSON & SONS, Ltd., 313, HIGH HOLBORN, LONDON.
Opticians to H.M. Government.

EXPANDED METAL

SYSTEM OF
REINFORCED CONCRETE
AND
FIRE-RESISTING CONSTRUCTION.



EXPANDED STEEL CONCRETE CEMENT STORE FOR THE WOULDHAM CEMENT CO., LTD., WORKS, WEST THURROCK.

Specialities:—

CONCRETE REINFORCEMENT; 3-in. mesh weights Expanded Steel for Foundations, Walls, Floors, Roofs, Bridges, Reservoirs, Sewers, Conduits, Hoppers, Silos, etc.

LATHING FOR PLASTER; Expanded Metal Lathing for Ceilings, Partitions, Exterior Walls, Steel Work Encasing, etc.

MADE-UP GOODS; Openwork Partitions, Fencing, Clothes and Tool Lockers, Machinery and Tree Guards, etc.

Full particulars on application to :—

THE EXPANDED METAL CO., LTD.,

YORK MANSION, YORK ST., WESTMINSTER, S.W.

Telegrams:—"DISTEND, LONDON." Telephones:—819 Gerrard; 1514 Victoria

THE HELLIWELL
PATENT "PERFECTION" GLAZING.

ADVANTAGES.

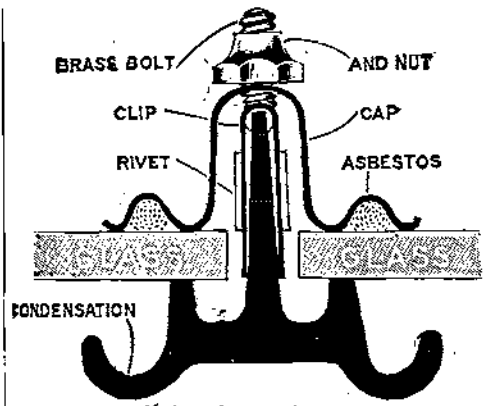
No Putty.
No Paint.

Guaranteed Watertight and Dust Proof.

Easily Repaired.

Planks laid in Safety across Caps.

Steel Bars galvanized; and also entirely covered with Lead to prevent Corrosion.



"ORDINARY" BAR.
"Ordinary" Section.
BARS of different strengths, to carry up to 12ft. without Purlin.
CAPS in either Copper, Zinc, or Lead.

EXTENSIVELY USED BY

H.M. Government, for Barracks, Dock Sheds, Post Offices, Stores, etc.

All the leading Railway Companies.

Municipal Authorities, for Markets, Baths, Libraries, Art Galleries, Schools, etc.

Also for every kind of Glass Roofing.

Head Office and Works: **HELLIWELL & CO., Ltd.,**
London Office: 11, Victoria Street, Westminster, S.W. **BRIGHOUSE, YORKS.**

PATENT VULCANITE ROOFING

FOR

FLAT ROOFS, CONCRETE ROOFS AND WOOD ROOFS.

ROOF TANKS

FOR

SWIMMING-BATHS, RESERVOIRS, BRIDGES.

EFFICIENT AND ECONOMICAL.

For Waterproofing Existing Faulty Concrete and Asphalte Roofs.

Will give with the movements of the building due to settlement, vibration, and expansion and contraction, and is guaranteed for long periods.

Special surfaces can be provided to the Vulcanite covering to meet any special requirements.

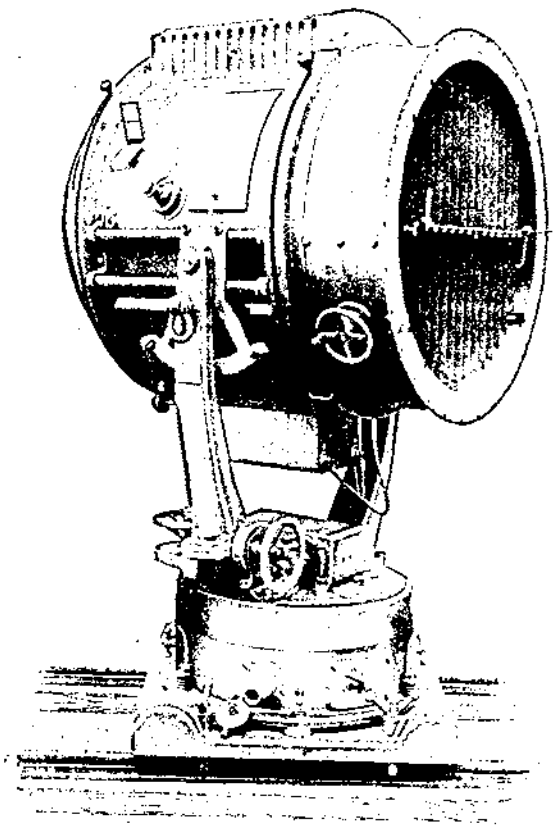
Full particulars on application to:—

VULCANITE, LIMITED, 118, Cannon St., London, E.C.
Laganvale, Belfast, and at MANCHESTER.

(Also Manufacturers of VULCANITE and BITUMEN Sheetings for the Sloping Roofs of Light Buildings, and for use as a Damp-proof Course).

Siemens Searchlight Projectors.

MADE IN ALL SIZES FROM 25 cm. to 200 cm.



75-centimetre electrically-controlled Projector, Type CJ, on rail carriage.

AS USED BY THE IMPERIAL JAPANESE GOVERNMENT IN THE LATE WAR WITH RUSSIA.

Projectors can be fitted with Siemens Patent Horizontal Automatic and Hand Lamp, or Horizontal Lamp for hand feed only. Mirrors of the metallic or glass parabolic type. Single or double Dispersing Lenses. Iris Diaphragm Shutter or Venetian Louvred Signalling Shutter. Electric Control is fitted for Fortress, Battleship, and other use, if desired.

Full Particulars on Application to M Department.

SIEMENS BROTHERS DYNAMO WORKS LTD.,

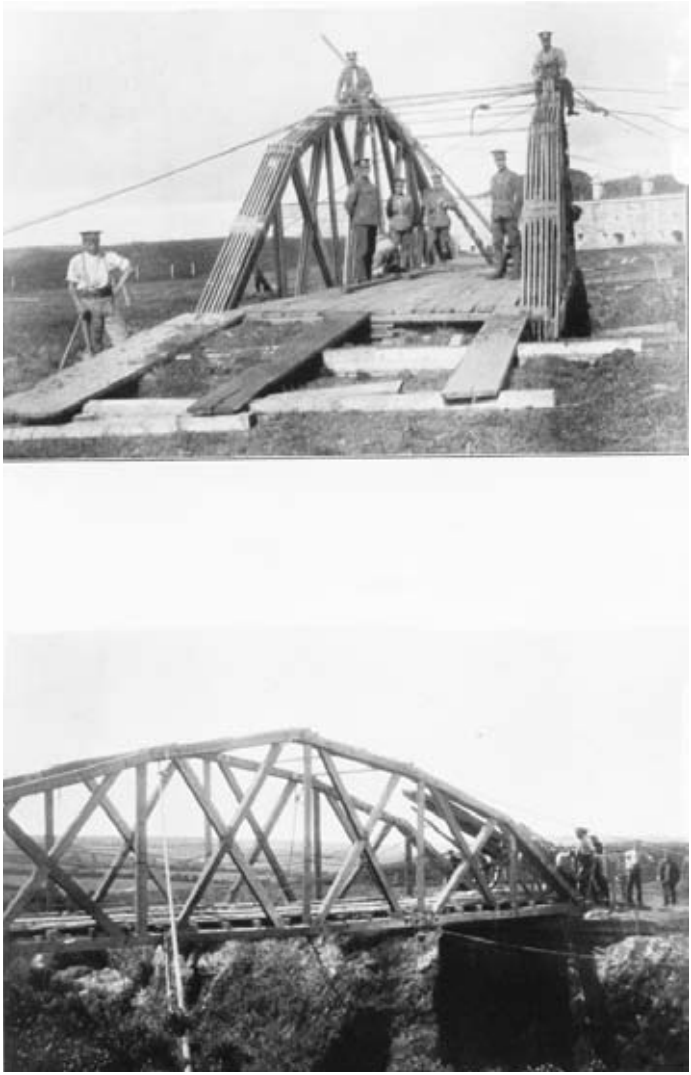
Caxton House, Westminster, S.W.

Telephone: GERRARD 860.

Telegrams: "SIEMBROTOS, LONDON."

CONTENTS.

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



A PLANK GIRDER BRIDGE

A PLANK GIRDER BRIDGE.

By Lieuts. C. H. R. Chesney and C. O'R. Edwards, R.E.

In the August issue of the *R.E. Journal* there appeared a description of an improvised lattice girder bridge, made up of round spars and bar iron.

The author apologized in his article for offering an account of yet another bridging expedient, with the excuse that few accounts of improvised girder bridges had appeared of late, and the authors of this article feel they must offer a similar excuse for this description of a plank girder bridge as designed by them and constructed by the 20th Company, R.E.

Plank girder bridges have been constructed during more than one course at the S.M.E., but in most cases, as far as can be ascertained, the planks used in the main girders have been placed flat, instead of on edge, and bent to give the required form if the girder chosen was parabolic. Therefore it is thought that the following notes may be of interest and use.

The chief features advocated for this type of bridge are :—

(*a*). That planks and timber from roof trusses are far more likely to be obtainable by a siege company on service, than spars of any dimension.

(*b*). That bolts are also more easily obtainable than lashings, seeing that they can be constructed by the blacksmith of the unit from any bar iron in the vicinity.

The parabolic form of girder was chosen in preference to a lattice type, as the latter does not give the necessary height to allow for top bracing, unless it is so deep as to be out of proportion. This top bracing is exceedingly necessary in this form of bridge on account of the "whippiness" of the girders, which must obviously arise owing both to the absence of any continuous beam throughout its length or even for half its length, and also to their absolute independence of each other above the roadway.

The calculations can be easily worked out with the help of the formulæ given on pp. 188 and 189, *Molesworth Pocket-Book*. The diagram and sections give all dimensions and details, and the photographs show the bridge as completed.

In the construction, wooden chocks were placed between the planks in the middle of their lengths, and iron gabion bands nailed around.

As a matter of fact, an extra F.S. of two was allowed in this case, and the bridge easily carried the weight for which it was calculated. The roadway, 9′ in the clear, was carried direct on the bottom boom.

As regards the practical construction and the launching of the girders into position, a few points are worthy of notice. Obviously all planks must be cut to the necessary length and marked before starting. The girders are then built up on their sides, according to the drawings, each joint being supported on little wooden piers, about 15″ high, made up of wooden chocks. When all the planks are in position, the bolt holes are driven through with augers. If enough long bolts are available for all the joints, it is a very simple matter to complete the girder by hammering the bolts through from above, but if, as was the case, short 5″ bolts had to be used for the verticals, and only one long bolt was available for each tension joint in the bottom boom, then the bolts must be driven through from underneath, after which sufficient planks must be taken off to allow the bolting of the verticals and the intermediate spiking (*vide* drawings of joints) to be carried out whilst rebuilding.

According to calculations, a 6″ overlap on each side of one bolt is sufficient in the bottom boom tension joints, but with timber of doubtful quality, as was actually used, it was considered necessary to add the spiking, seeing that the number of bolts could not be doubled, the danger being that the resistance to shearing of the timber was somewhat meagre.

In launching, the best way would appear to be to launch both girders together in a vertical plane, with all the necessary side guys attached. When across the gap, they can be easily got into the exact position by levering their ends sideways. If the girders are launched separately, their inner side guys will be found to interfere with each other.

As regards the weight carried, a concentrated load of $2\frac{1}{2}$ tons on a single pair of wheels was placed in the middle of the bridge. At another time about 60 men crowded in the centre, say 5 tons, was carried without any signs of deflection.

This form of bridge takes very little time to construct; 30 men should easily complete the whole bridge of 54′ span in one day, the materials having been collected on the site on the previous day.

AN EXERCISE IN FIELD TELEGRAPH TACTICS.

By Major E. G. Godfrey-Faussett, R.E.

We have at present no manual of instruction in the methods of utilizing army telegraph units, and the following scheme has been worked out partly from theory and partly from practice during the training this year of the telegraph units at Burghclere.

Before going into the details of the work itself, it may be as well to state clearly a few axioms which should always be borne well in mind :—

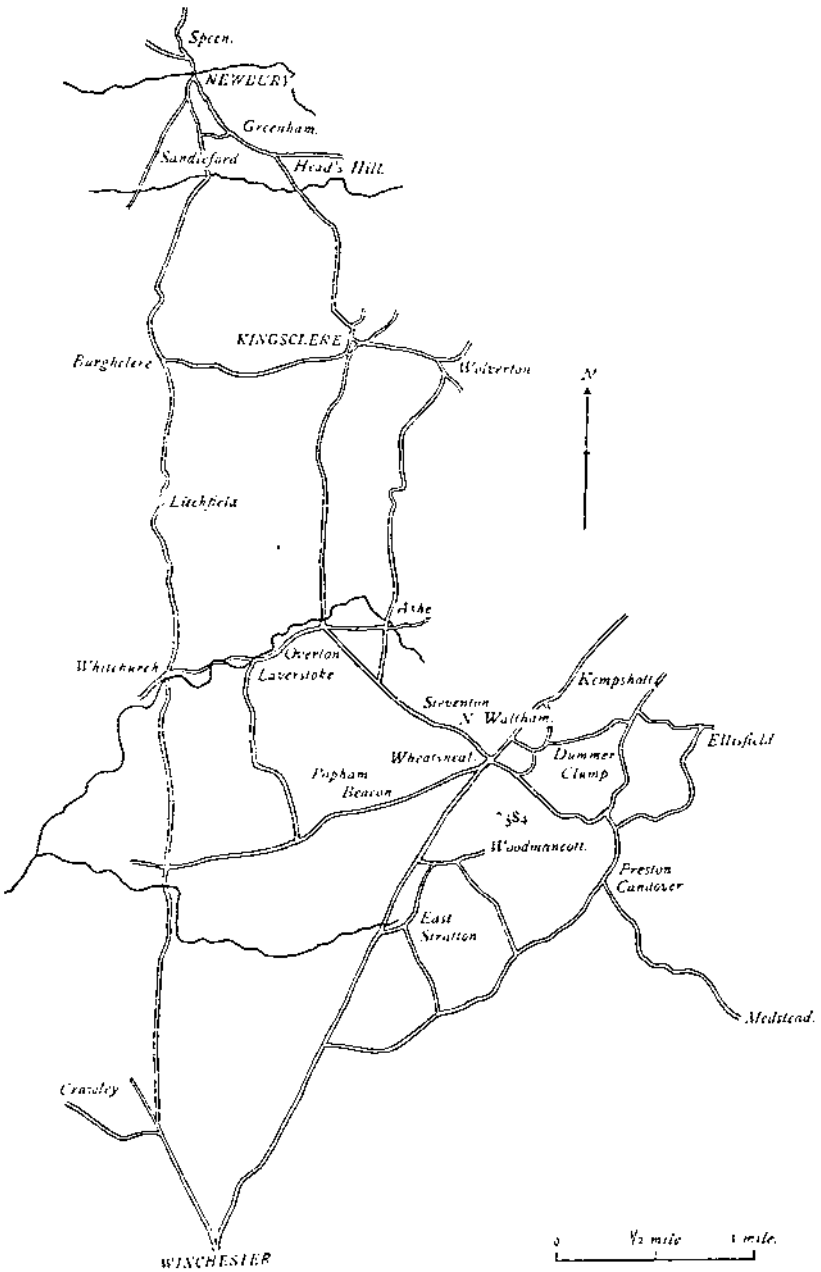
1. The chief duty of *air line* is to keep the commander of a force in touch with his advanced base ; of *cable*, to keep him in touch with his divisions, and with such other bodies of troops as he may keep under his personal control. The divisional telegraph companies are concerned solely with the internal communications of the divisions, and are not referred to here at all. Wireless, as at present organized, is concerned solely with the communications of the strategical cavalry, and also does not come into the scheme.

2. *Inter-Communication.*—Troops are controlled by the Director of Army Signals, who receives orders from the Commander-in-Chief through the C.G.S. Similarly, for a detached force, an A.D.A.S. would probably be appointed, who would receive orders from the C.G.S. of the force.

3. *Army telegraphs* are constituted into units of air line and cable, called companies, but the exigencies of warfare would so often entail these units being split up, that it is better to consider them as sections, each under a subaltern, with two detachments in each section.

4. *A cable section* consists of two detachments, each containing 10 miles of cable, and two third-class (buzzer) offices. Each detachment is complete in camp equipment, and carries one day's supplies. *A cable company* consists of four sections and a ninth detachment belonging to headquarters. The headquarters includes spare men and horses, one major, and one captain.

5. *An air-line section* consists of two detachments, each containing 10 miles of air line, and two second-class (Morse simplex) offices. Each detachment is complete in camp equipment, and contains one day's supplies. *An air-line company* consists of three sections and a headquarters, including spare men and horses, one major, and two captains.



SCHEME.

A Red army, based on Liverpool, is holding the line, Bristol-Reading-Cambridge. The Blue forces hold London and the south-east of England.

Oxford is an advanced depôt, where spare telegraph troops have been concentrated. The 1st Air-Line and 1st Cable Companies are there.

NOTE.—All G.P.O. telegraphs are supposed to be non-existent.

At 8 p.m., on July 1st, Major P., commanding 1st Air-Line Company, receives the following telegram (in cypher) from Director of Army Signals :—

"You are appointed A.D.A.S. of a force of three divisions, under General Z., which concentrates at Newbury and advances against Blue forces at Winchester on 4th July. Your own company (less one section) and the 1st Cable Company are at your disposal. A.D.A.S., Lines of Communication, will make the necessary arrangements in rear of the advanced depôt at Newbury. Assistant Director of Transport at Oxford has been warned that you will require extra transport for air line, which can be drawn from telegraph depôt at Oxford."

Major P. at once warns Major T., commanding the 1st Cable Company, to be ready to start for Newbury at 5 a.m. on the 2nd. He details his third section to remain at Oxford, as ordered, and leaves one captain in charge. He has available Capt. Q. and two sections ; No. 1 under Lieut. R., and No. 2 under Lieut. S. Major T. has Capt. U. and four sections ; C under Lieut. V., D under Lieut. W., A under Lieut. X., and B under Lieut. Y., with a ninth detachment.

From Newbury to Winchester is about 25 miles. The two air-line sections carry 20 miles air line. Major P. therefore considers about 20 miles spare will be necessary, and indents on A.D.T. for two wagons and teams to join his camp that night. These are at once loaded up with 20 miles air line (1 air-line unit, weight 8,700 lbs.) and two first-class offices (duplex, weight 1,300 lbs. each)—total weight, 11,300 lbs.

The column leaves at 5 a.m. on 2nd and marches 26 miles to Speen, on the outskirts of Newbury, where it bivouacs. It is a long march, but as there is no work to do, the spare men (who have to walk normally) can be given a lift for half the distance.

Major P. leaves Major T. in charge of the column, and rides on to Newbury himself, taking Capt. Q., who will be in charge of the base office and maintenance of the proposed air line. They arrive at Newbury by 10.30, and while Capt. Q. sees to a bivouac ground and supplies, Major P. reports to the C.G.S. of the assembling column, and ascertains, as far as possible, what is to be the plan of operations.

He is told that information has been received of the collection of Blue forces at Winchester, and that orders have been received for the column to operate against them—driving them back if possible and occupying Winchester. The troops are arriving by road and rail to-day and to-morrow, and are bivouacking :—1st Division at Head's Hill, 2nd Division at Sandleford Priory, 3rd Division (reserve) and headquarters at Greenham Lodge. The advance is to be made at 5 a.m. on the 4th—1st Division to Steventon *viâ* Overton, 2nd Division to Laverstoke *viâ* Litchfield, 3rd Division and headquarters to follow the 1st Division as far as Overton.

Major P. has therefore the whole of the 3rd July available to make his arrangements. He details his detachments as follows :—

Capt. Q. in charge of base office at Newbury and the maintenance of the line. Lieut. R. (senior to Lieut. S.) in charge of air-line construction (four detachments available).

Major T. to control the cable work each day from the base cable office. Capt. U. to assist generally. Lieuts. V. and W., with four detachments, to keep 1st Division in touch; Lieuts. X. and Y. with 2nd Division. The ninth detachment is made up into a section (lettered E) by the addition of a cable wagon from No. 2 Air-Line Section, the detachment being found from the spare men of the cable company (commanded by the C.S.M.), and told off to keep headquarters in touch.

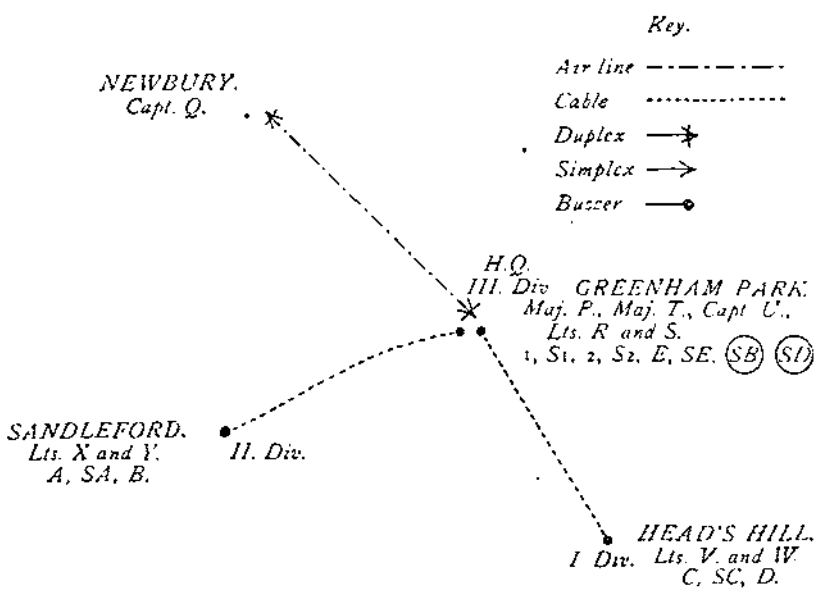
Spare men and wagons from both companies (including the two A.S.C. wagons) are made into a column under C.S.M., Air-Line Company. C.Q.M.S., Air-Line Company, is told off to assist Capt. Q. as inspector; C.Q.M.S., Cable Company, to look after supplies for telegraph details at headquarters.

Capt. U. sets up one of the first-class offices near the Lines of Communication telegraph office at Newbury, taking operators from No. 1 Air-Line Section. Lieut. R. runs air line from Newbury to Greenham Park (2 miles), and opens the other duplex office there. Telegraph headquarters move to Greenham Park.

Lieut. V. marches his command to the 1st Division at Head's Hill, running a cable line from Greenham Park, and leaving a cable detachment at Greenham Park to pick up (emptied of line stores into the other three detachments).

Lieut. X. acts similarly with the 2nd Division at Sandleford.

SITUATION ON NIGHT OF 3RD.



NOTE.—The second detachment of each section is distinguished in the following pages by the letter S before the number or letter of the detachment. In the diagrams a circle round the letter denotes that the detachment has been emptied of line stores.

4th July.—*1st Division* starts at 6 a.m. and marches to Steventon Park *viâ* Kingsclere and Overton (12 miles). It arrives at 10.30. Lieut. V. leaves one detachment (D) at Head's Hill for the following purposes :—

(*a*). To keep an office open till the camp is cleared.
(*b*). To supply linemen during the day's advance.
(*c*). Eventually to reel up the line from Head's Hill to Steventon.

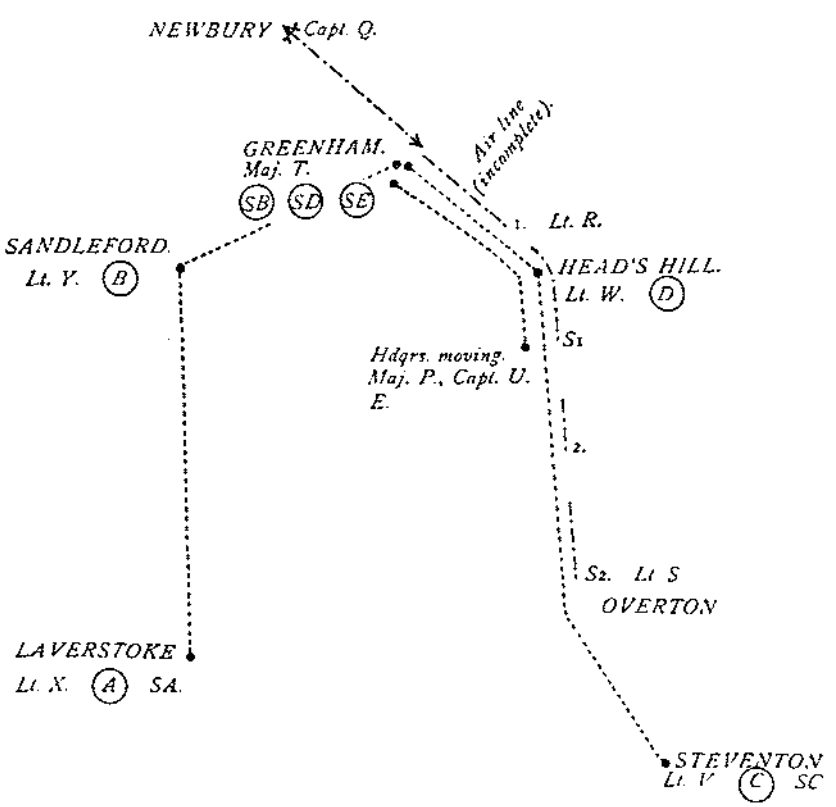
Lieut. W. is left at Head's Hill to look after maintenance.

Lieut. V. accompanies G.O.C., 1st Division, running out line from C Detachment, working into a base at Greenham Park under Major T. Base office and lineman are found from SD Detachment.

On arrival at Steventon, Lieut. V. reports by wire to A.D.A.S., and holds SC Detachment in readiness to run a cross line to headquarters when ordered.

2nd Division starts at 6 a.m. and arrives at Laverstoke at 10.30.

SITUATION AT 11 A.M., 4TH JULY.



Lieut. X. makes similar arrangements, Lieut. Y. and B Detachment are left at Sandleford, A Detachment runs the cable, SA is in readiness to run the cross line.

3rd Division starts at 10 a.m. and marches to Overton.

Headquarters accompany the head of the 3rd Division. E Detachment runs cable with them, SE remaining to pick up. Major P. accompanies headquarters.

Meantime Lieut. R. has divided the road from Greenham Park to Overton into four lengths, and has put his air-line detachments on it at intervals. The work will be slow, as the road is blocked with troops, and it will be necessary to run the air line over the fields on each side. The distance is 10 miles, or $2\frac{1}{2}$ miles per detachment. The work will take about 5 hours and the march $2\frac{1}{2}$ more—the line should be through at about 2 o'clock, or at about the time headquarters arrives.

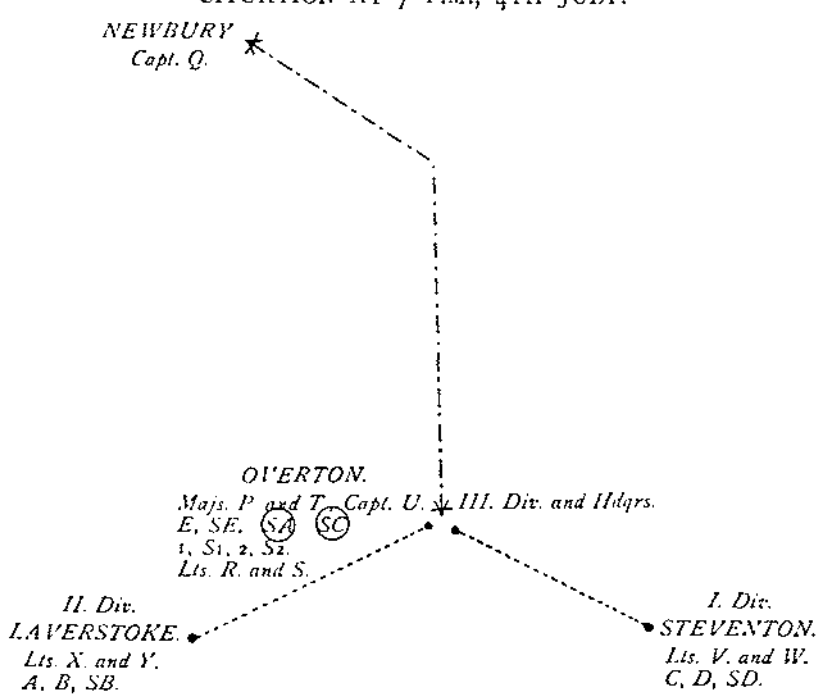
A first-class office is opened at Overton, Capt. U. being in charge.

On arrival of headquarters at Overton, Major P. sends telegrams to Lieuts. V. and X. telling them where the position of the camp is. They at once run cross lines in with SC and SA Detachments.

As soon as the air line is through to Overton, Major P. gives orders to Major T. that the cables may be picked up. The start under the above conditions would probably be made about 3 p.m., and the cable would be all picked up by 7 p.m.

The diagram would then be as follows :—

SITUATION AT 7 P.M., 4TH JULY.



From which it will be seen that the detachments are arranged in exactly a similar manner to that of the night before, and are ready to repeat the operation for another day's advance.

NOTES.—(*a*). If, as frequently might be the case, the commander were to wait at Greenham till the afternoon, and then to go on at once to Overton in a motor car, the centre cable line would not be required, as communication with the 3rd (Reserve) Division would probably be unnecessary. E. and S.E. would then be spare.

(*b*). In the particular scheme taken the two divisions are very close to Greenham on the night of the 3rd—they might well be further off. The fact that the 1st and 3rd Divisions use the same road also somewhat complicates the standard diagram.

(*c*). It might well happen, especially in the case of an opposed advance, that the times would all be much later, and that consequently the cable lines would have to be picked up in the dark. This has been proved practically to be quite feasible. If the cross lines are run in the dark, Lieuts. V. and X. should accompany the detachments personally, and then return to their divisions.

(*d*). One of the subalterns on air line (Lieut. R.) should work with the rear detachment. If this detachment completes its portion and catches up another, he should remain with the one in rear. His duty is to test the line to the rear at intervals to ensure its being in good order, and he should not leave it until it is working well. He should keep a cable wagon with him in case the construction is overtaken by darkness and it becomes necessary to complete with cable.

5th July.—On the evening of the 4th the enemy is located on the line Medstead-Crawley, and the commander issues orders for an advance and attack.

The 1st Division is to attack *viâ* Preston Candover, 2nd Division *viâ* East Stratton, 3rd Division to be in reserve at Wheatsheaf (S.E. of N. Waltham). A.D.A.S. is also warned that communication will be required to two balloons, a mounted brigade on the left flank, and the heavy artillery, which has been withdrawn from the divisions and combined. The commander proposes to go to the high ground at point 584 (S. of Wheatsheaf), where he can get a view, but headquarters will be at Wheatsheaf.

Major P. must therefore be prepared for rapid communication from some 6 or 7 points to headquarters at Wheatsheaf. He must keep up communication to Newbury, and be ready for either an advance or a retirement after the engagement.

The three divisions start at 5 a.m. Headquarters will move from Overton to Wheatsheaf at 7 a.m.

Major P. makes the following arrangements :—

Lieut. V. to follow the 1st Division with C Detachment, sending in Lieut. W. with D and SD to report at Wheatsheaf at 6 a.m. Lieut. X. to follow the 2nd Division with A Detachment, Lieut. Y. to report at Wheatsheaf with B and SB at 6 a.m.

Major T. to take E and SE to Wheatsheaf by 6 a.m., and to take charge of all six detachments.

Capt. U. to remain in charge at Overton.

Lieut. R. to run air line to Wheatsheaf as soon as road is clear of the 3rd Division.

By 6 a.m. D and SD are the only detachments that have arrived, the others all being blocked by troops moving, and not arriving till E and SE at 6.30, B and SB at 7. Major T. has slipped through himself, having got further information before starting that—

Mounted brigade is to be at Ellisfield.
Heavy artillery at Dummer Clump.
A balloon at Kempshott.
A balloon at Popham Beacons.

He chooses a suitable field at Wheatsheaf for the Headquarter Office, and gets out a diagram of the connections required to which he can work.

Lieut. V.'s line (with the 1st Division) is cut at Wheatsheaf, and a spare office put on either end.

D and SD are sent out at once to point 584 and balloons at Popham Beacons, as these roads are clear.

On arrival E and SE are told off to balloon at Kempshott and mounted brigade at Ellisfield.

On arrival B is sent to HA at Dummer, SB remaining spare.

All the detachments work outwards from Wheatsheaf. The times are approximately as follows :—

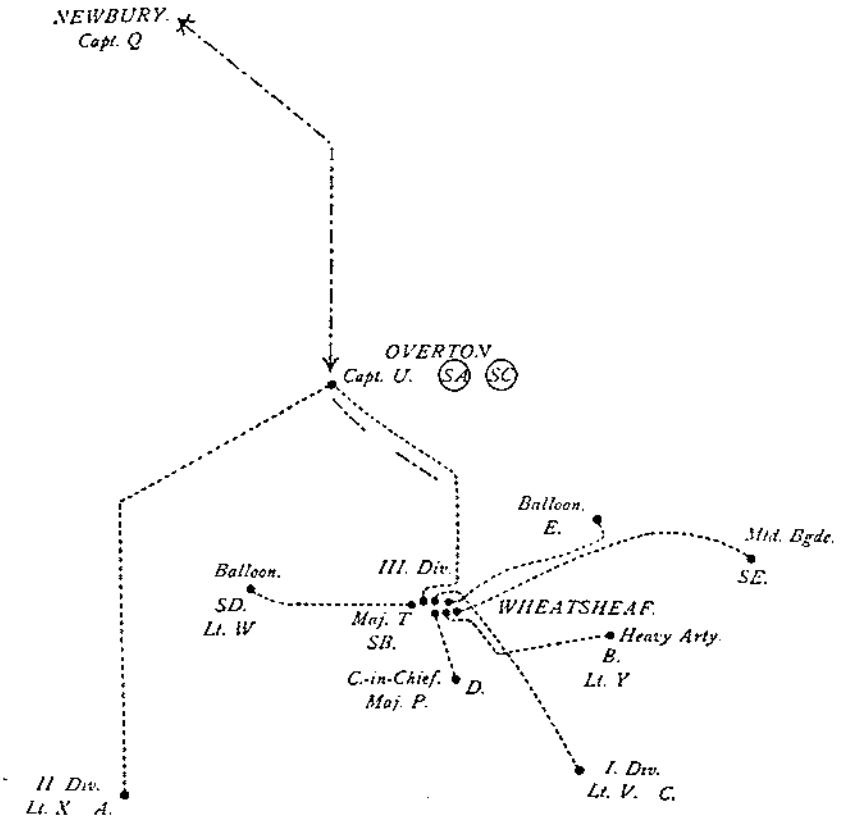
D.—Arrive 6 a.m.	Leave 6.30.	Through to 584 6.45.
SD.—Arrive 6 a.m.	Leave 6.30.	Through to balloon 7.0.
E.—Arrive 6.30.	Leave 6.45.	Through to balloon 7.15.
SE.—Arrive 6.30.	Leave 6.45.	Through to mounted brigade 8.0.
B.—Arrive 7.0.	Leave 7.15.	Through to HA 7.45.

The enemy is in force, and the Red force can barely do more than hold its ground. This situation, only reported by wire to the distant C.-in-C. of Red forces, produces from him an order to fall back gradually to the strong position on the high ground S. of Kingsclere. This order is received at 6 p.m.

The commander issues orders at 6.30 p.m. for the 3rd Division to act as rear guard, holding the line Woodmancott-Dummer to-night, with divisional headquarters at Wheatsheaf. The 1st and 2nd Divisions to retire to-night to their old camps at Steventon and Laverstoke. Further retirement to be made on 6th—1st Division *viâ* Ashe to Wolverton, 2nd Division *viâ* Litchfield to Burghclere, 3rd Division (rear guard) *viâ* Overton to Kingsclere, new headquarters to be at Kingsclere. 1st and 2nd Divisions to start at 5 a.m., 3rd Division to be clear of Overton by 7 a.m., headquarters move at 5 a.m. by motor.

At 8 a.m. the diagram is as follows :—

SITUATION AT 8 A.M., 5TH.



Major P.'s problem to-night is to get his detachments back to their places ready for an early retirement to-morrow. A and C will naturally reel up with their divisions; but C must now stop at Wheatsheaf for the 3rd Division.

The remainder of those working out from Wheatsheaf reel up to that place as soon as they can be spared, and are then distributed as follows :—

With 1st Division at Steventon—D, SD, and SE.
With 2nd Division at Laverstoke—A, B, and SB.
With 3rd Division at Wheatsheaf—C.

At Overton SA, SC, and E. E takes in enough spare line stores from the other detachments to fill up SC.

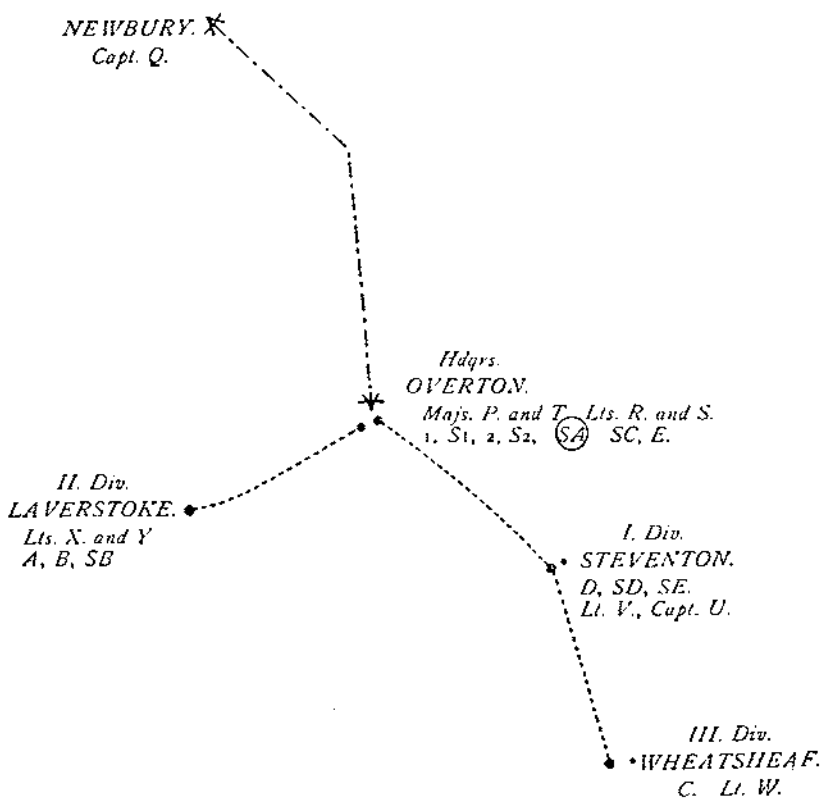
The air line from Overton to Wheatsheaf is either abandoned or picked up as far as possible.

NOTES.—(*a*). A clear head and rapid decision on the part of Major T. and good drill and quick appreciation on the part of the

detachment commanders are required to get the central office at Wheatsheaf working without undue delay. Each detachment must be provided with a diagram of the circuits for the day before it leaves.

(*b*). The arrangement by which the Headquarter Staff remain at the base cable office and the commander goes on where he can see, is one which is frequently adopted and which has everything to recommend it from a telegraph point of view. Special attention must be paid to the cable to commander, or a block will occur; if however the staff remains at the base office, the work on this line is not likely to be unduly heavy.

SITUATION ON EVENING OF 5TH.



6th July.—The detachments are early astir, leaving camp as soon as it is light enough to see anything (about 3 a.m.).

B and SB, under Lieut. Y., run fast cable *viâ* Litchfield and Burghclere (where an office is dropped) to Kingsclere. Distance, about 13 miles; time, 2 hours. The roads are clear.

D and SD, under Lieut. V., run fast cable *viâ* Ashe and Wolverton (where an office is dropped) to Kingsclere. Distance, 10 miles; time, under 2 hours.

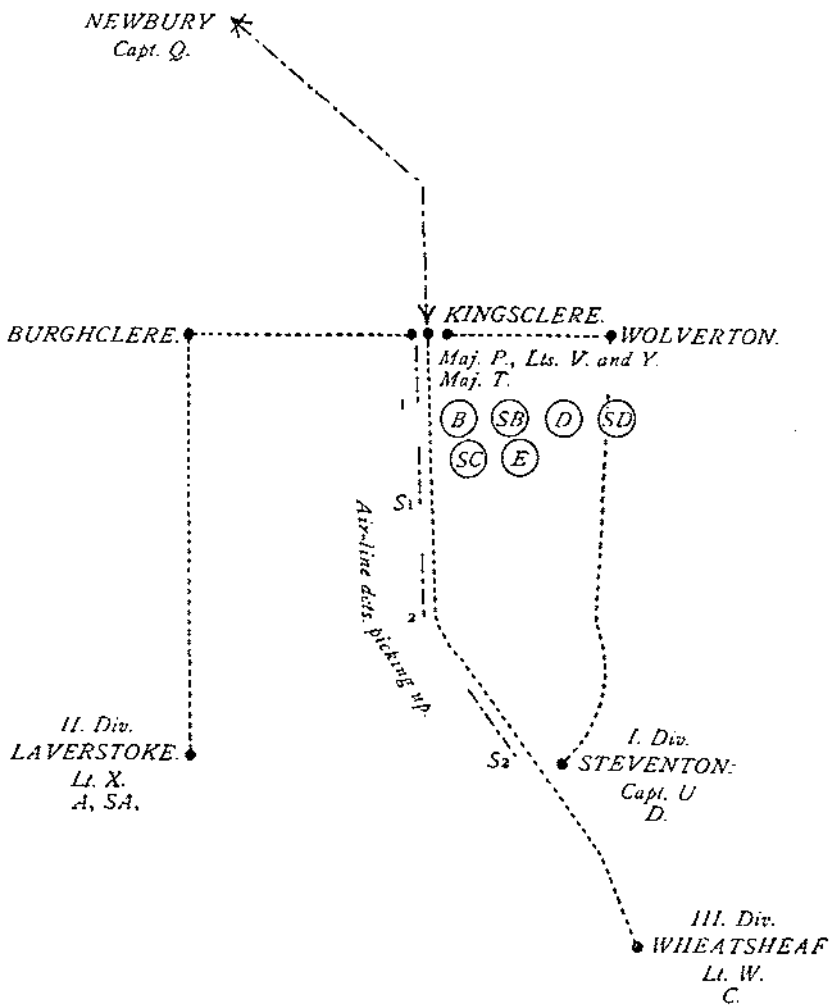
SC and E, under Major T., run fast cable to Kingsclere. Distance, 5½ miles; time, 1 hour.

Lieuts. R. and S. get the air line picked up, starting as soon as headquarters leaves Overton, and abandoning any that cannot be removed before the road is blocked by the 3rd Division.

Capt. U. with D., Lieut. X. with A., Lieut. W. with C., pick up the lines with the 1st, 2nd, and 3rd Divisions respectively as they retire.

Major P. gets back early to Kingsclere, and arranges the office there.

SA picks up the line Overton to Laverstoke, and comes in with A.



NOTES.—(*a*). On a clear road, two good detachments, working fast cable drill, can be relied upon up to 12 miles in 2 hours—

possibly even a little quicker. For a greater distance than this the pace would begin to tell on the horses.

(*b*). In this scheme the running-out detachments got 2 hours daylight before the divisions moved. If the start had been earlier, the cable could have been run more slowly by night. If there is no time available, the communication must lapse till the lines to the rear have been run out.

General Remarks.—In the above scheme an attempt has been made to provide for three typical cases—an advance, an engagement, and a retreat; but of course the variations are infinite.

Practical trials show the great necessity of care on the following points:—

(*a*). Every telegraph office must be provided with a clear diagram of the circuits existing. These should be copied by hand before starting whenever possible; any changes must be telegraphed.

(*b*). The call signals of offices require careful consideration in order to avoid confusion. The method which appeared to give the best results was that each moving wagon should have as call its own letter prefixed by P, thus PA, PSC. When an office was definitely established at a given point, a two-letter call, derived from the name of the place, was at once adopted, and reported to A.D.A.S. (thus GP for Greenham Park).

(*c*). When a cable detachment runs out a line, leaving another to pick up, the base operator, office, and lineman should be found from the detachment detailed to pick up, that running out going on complete. Otherwise it is frequently almost impossible to get the base office back to its own detachment.

(*d*). The senior officer or N.C.O. in charge of a detachment should be personally responsible for the traffic. He should have subordinates ready detailed to arrange for (1) care of horses, (2) cooking for men, (3) provision of supplies for next day; so that he has not to give more than a general supervision to these important matters.

(*e*). The mixing up of units referred to in "axiom" 3, becomes very manifest. Officers employed on intercommunication service must be interchangeable, and each system must be directed by the senior officer, irrespective of what unit he belongs to.

THE EMPLOYMENT OF SAPPERS ON THE WORKS—SOME SUGGESTIONS.

By Lieut.-Colonel W. Baker Brown, R.E.

In the very interesting article on the above subject in the April number of the *R.E. Journal*, "A Company Officer" describes clearly and forcibly the point of view of those who think with him that the military training of the Sapper, especially in field companies, should swamp his engineering duties.

On this thesis he builds up a carefully arranged superstructure for their employment on works, principally with the idea of effecting thereby a financial saving. But there is another side to this question if it is considered from the only essential point of view—the work to be done by an Engineer company in war.

The general commanding an army in the field will look to his Chief Engineer not only for field entrenchments, obstacles, and military bridges, but also for much work, which would come under the definition of "works," as carried out by the R.E. in peace. Such "works" might include, at the base of operations, the construction of piers, the improvement of approaches, the alteration or even the erection of such buildings as hospitals, barracks, or stores. On the line of communications there are again roads to make and mend, bridges to erect or repair, while semi-permanent camps and hospitals will require drainage and water, and hutting may have to be erected.

On the line of march the duties will be mainly of a military nature, but as soon as the army halts, "works" duties in connection with water, drainage, and roads will again fall on the Engineers.

In any campaign the period of preparation and concentration is necessarily long, as compared with the time occupied in marching and fighting. It is therefore probable that the demands on the Engineers for "works" will be ten or a hundredfold greater than the demands for fieldworks.

If this view is correct, then the employment of Sappers on "works" in peace is a direct preparation and training for duties

which they will have to do in war, and is quite as important from the military point of view as the less difficult if more interesting field training.

Even assuming a quite different proportion, there are many points in which a careful training on "works" in peace may form a most valuable training for the execution of purely military projects in war time.

In both cases there should be a well thought-out design, with due consideration given to local conditions and materials available. In both cases there should be economy of time, tools, materials, and labour. In both cases there should be a careful organization, so that all men are employed to the best advantage, and that tools and materials are at hand, when wanted, without either starving the work by delay in the receipt of stores, or overcrowding the store depôts and perhaps congesting the line of communications by demanding stores in excess of requirements.

But while many officers admit this to some extent, they will not extend their admission to consider "incidental" services about barracks as anything but harmful. And yet, I suggest, that these very incidental services might be made a most valuable training for the junior ranks, in placing responsibility on individuals and exercising forethought in small details.

Let each barracks or group of barracks be placed in charge of a small squad of mixed trades—a couple of carpenters, a plumber, a glazier, a painter, a labourer or two—one to be a junior N.C.O. Give them a suitable equipment of tools, a building as a shop, and authority to obtain stores in small quantities. Then let the N.C.O. understand that he will be judged by the efficient repair of the barracks, and that all minor repairs can be carried out by him as soon as discovered, all action being reported to the foreman of works.

The quartermaster, or other O.C., might be allowed to report urgent requirements direct to this N.C.O., but much requisitioning and correspondence might be saved by a systematic inspection of water taps, sanitary appliances, fittings for lighting, sash lines, locks, ranges, etc. A stitch in time saves nine, and early repair is not only cheapest, but saves the tempers of the occupants and the waste of water, gas, or fuel. Small renewals and periodical services might be allotted to this squad.

But a field company officer may possibly say "This is all very well and is a very good description of the work of a fortress company at the base or on the line of communications, but a field company must be kept for more purely military duties." As an example, I have known an officer grumble because his field company was employed—

after the advance on Pretoria—on concrete work in connection with a general hospital.

How far it is desirable to rest the Engineer units for a few days prior to an advance is a matter for the Chief Engineer in any particular case, but it seems the obvious duty of all Engineers to be ready and willing to undertake any engineering operation, and for this a careful peace training on "works" is essential.

Another curious point in the article I refer to is the line drawn by "A Company Officer" between men working in squads under the supervision of their officers, and those employed as clerks, storemen, or engine drivers or "absorbed in the R.E. workshops." All these latter are referred to as if they were wasted, and the employment of men on "Station" duties as very undesirable. Similarly he thinks printers and suchlike should be on the Supernumerary Staff and not in the unit.

With this view I entirely differ. Any engineering operation requires an efficient organization of the clerical and store duties, just as much as of the working parties. To say that the office organization is the duty of the C.R.E. or D.O., and that the unit only carries out the work, is to overlook some of the primary conditions of work in war. In war time there will be no organization of a D.O.'s office ready made into which the work of a field company can be fitted, but the company will have to develop an organization for the purpose from its own *personnel*. Of course, in war time some of the financial checks, necessitated in peace by our political system, will be dropped, but there will still remain the necessity for a careful store record, and an irreducible minimum of clerical work, which requires trained handling if the officer is to get the best result out of his men.

Again, the Supernumerary Staff (to use the old term) is in essentials a staff of senior N.C.O.'s with certain special qualifications. The individuals are not posted to units, mainly because their military rank would give them undue seniority. They correspond in that sense to the regimental staff of a battalion. But they are just as much part of the engineering organization as any junior N.C.O. of the units.

In a few special instances, such as wireless telegraph and electric light units, mechanists are included in the war establishment, while clerks and storekeepers are also included in other cases. But foremen of works are not recognized in the field. Would there not be many advantages in attaching a military foreman of works to every field company, in the same way as they are generally employed in fortresses in superintending military works on mobilization?

Although the Supernumerary Staff is treated for certain military purposes as detachments of one large unit, there is a distinct gain in attaching them to the local unit, when one exists, for such purposes as pay, quarters, and clothing; not only does this save the necessity of keeping a separate system of accounts for a small group of N.C.O.'s, but it brings the Supernumerary Staff into much closer touch with the military side of the engineer organization. Similarly all men, such as the junior clerks, storemen, printers, etc., who can be so dealt with, might be posted to the unit. This might make a little trouble for the O.C. Company in arranging duties and exemptions, but would surely be much better for the men concerned, and it emphasizes the military character of the whole organization. And this leads at once to a consideration of the other side of the question, viz., the military training, which in the opinion of "A Company Officer" necessitates the attendance of every individual man of the company for a solid six months of the year.

If we look at the syllabus of the courses which now constitute the annual programme of military training, we shall at once see that in the case of the engineer companies we can subdivide the training into two distinct parts, the training as a soldier, the training as an engineer.

The former may be further divided into three heads, (1) the use of the rifle, (2) sufficient drill to enable the company to move to any desired point without hurry or confusion, and (3) a knowledge of the military organization and military requirements of other arms.

The engineer training may be divided into two essentials:—(1), A knowledge of the special equipment carried in the field by each unit and the best methods of using it, and (2) the execution of larger works, such as a heavy bridge, blockhouse, or entrenchment.

It is also evident that the annual training involves the teaching of little that is new, but is mainly a repetition of work already learnt in detail as a recruit.

Taking first the military side, in the opinion of many, the best way to practise drill is to devote to it one or two hours a week throughout the year. The same principle holds with the use of the rifle, only that the want of ranges and a somewhat short allowance of ammunition necessitates the concentration of the actual work on the ranges into a "course" of about a week's duration. There remains then to be acquired a familiarity with other arms, which can only be partially acquired in barracks, and requires the close companionship of work in the field to become really effective.

On the engineering side, familiarity with equipment is best obtained

by combining the use of tools with the weekly drill, provided some ground for practice can be obtained in the neighbourhood of barracks. And if suitable works organization has been established and practised, the execution of a larger engineering project, such as a blockhouse, redoubt, or heavy bridge, becomes mainly a question of getting the materials on the spot, the execution proceeding on the same lines as a job in peace.

There remains the use of technical equipment to consider. Omitting the special case of such units as balloon, telegraph, or electric light companies, where the technical training required is considerable, the special technical training for field and fortress companies is practically limited to two things—the use of explosives and bridging over water; these must be provided for. The last is especially important for companies not stationed near the sea or a large river, as the handling of boats cannot be learnt in a pond or canal.

But it will no doubt be urged, and justly, that the above summary deals mainly with the training of the sapper, and that the training of the officers and N.C.O.'s demands the assembly of the company as a whole in order to practise the handling of a large body of men in the field. This will surely be best obtained by a regulated system of training, under which the training of the individual will merge into that of the section, and the section into the company. But of the possible grouping, I am inclined to lay most stress on the training of the section under its subaltern.

This is for Engineers the real fighting unit, and corresponds to the company of an infantry battalion. It is only on special occasions that a major of a field company will find himself personally directing the work of his whole company; more frequently he will be left with his headquarters only, while his sections are carrying out the work, and looking to company headquarters to supply them with tools, stores, and food. Further, his peace unit is only a skeleton of what he will command on mobilization, and the lessons learnt by handling a skeleton only are apt to be misread.

Taking all the above into consideration, I suggest that the military training of an engineer company might consist of the following:—

(1). An *individual* training throughout the year, including weekly drill, musketry exercises, and such elementary engineering as gabions, fascines, shelter trenches or spar bridging. Lectures to be given periodically and bad weather utilized for simple exercises in working out details of work in the field.

(2). *Section* courses of musketry (1 week) and military engineering (2 to 3 weeks), the latter to include the selection of a camp site and the collection of the necessary material, with as much water work as possible.

(3). A *company* course of a week or 10 days, to be conducted as a practical examination of the sections and individuals by the commanding officer. This would be followed by the annual combined manœuvres with other arms.

Once every two or three years an extra course of pontooning or siege work might also be possibly arranged.

In addition, general officers might call on the Engineers for assistance with the training of other arms, and might also require actual work to be carried out in preparing camps, etc. This latter would be treated as a "works" service.

But the point I want to make is that none of the above is inconsistent with the supervision of "works." Except for the company course or for manœuvres, it should always be possible to keep half the company in barracks, and even during manœuvres men required for special work, as for instance engine drivers or printers, could remain in barracks every second year with no detriment to the training.

The organization which I would suggest to carry out the above, is as follows for a field company on the home establishment. The principle will apply equally to fortress companies, but as these have a varying establishment, the details will differ.

The officers of a field company in peace should be 1 major, 1 captain, and 2 subalterns. The major would command the whole company, and would be the division officer of the whole area in which the company is employed. This is a most important point, as it then rests entirely with him to adjust the varying claims of "works" and military duty.

The captain would help the major with the division work and act for him while absent, but his special duty should be the military details of the company, pay, clothing, food, and barracks. He should be in charge of the horses, vehicles, and field equipment.

The men of the company would be divided into a headquarters and two sections, each section having attached to it a cadre of another section, which would be filled out on mobilization.

Each section should be under a subaltern, who would have charge of a subdivision for "works."

If central workshops exist for a division, they could be in charge of one of the sections or be placed under the captain, but such details and many others would depend on the local arrangements of barracks and areas.

I suggest that on the above lines a combined works and military organization could be developed which would produce the fine combination of soldier and sapper which we look for in our military engineers.

In conclusion, two points of detail which may cause difficulty may be briefly referred to.

The first is the paucity of men in a home unit. This is an admitted evil which can unfortunately only be remedied at present by reducing the number of cadres. Such a reduction however is practically impossible, as the ever-increasing application of science to modern warfare leads to the formation of new cadres of military engineers instead.

But from the works point of view it can be met by supplementing the military labour by the engagement of pensioners, the utilization of infantry, or in other ways which were suggested by a company officer. Pensioners from R.E. might be always employed with advantage in the central workshops, and when employed would form a convenient nucleus quite capable of carrying on any urgent work during the absence of the company at training.

The second difficulty is the existence of the triennial contractor. The system of ordering work on a schedule and paying for it by an arbitrary scale, which includes materials, labour, supervision, and a host of minor expenses in one payment, is quite unadapted for war.

Its use thus necessitates special knowledge from officers and men, which has little military value.

In war time the Engineer officer has himself to do the work of collecting material and men, and has to arrange for its supervision, all of which is done for him in peace by the contractor.

On the other hand, an order on the triennial contractor is for many officers and foremen of works a happy solution of an engineering problem, as no foresight is required and it involves the minimum of work until the job has to be measured. As long as a triennial contractor exists, the temptation to employ him will always be present. Even if stores only are ordered on the triennial contractor, the officer is still avoiding the useful exercise of finding the best source of supply.

The remedy is, I suggest, to abolish the triennial contractor and to substitute local contracts for the supply of building materials, etc. Even if no military labour be available, a system of direct employment

of day labour should be feasible, and will give excellent training to officers and foremen.*

It must however be noted that the direct supervision of work requires more staff both in the office and on the works, a larger stock of stores is required with suitable store buildings and *personnel* to handle them, and a good central workshop is a necessity for economical working. The present system under which all permanently employed staff is paid on a separate subhead of the Vote, instead of being charged against the various items, rather prevents elasticity and undoubtedly militates against the general adoption of a direct system.

* It is understood that in the revision of the "Regulations for Engineer Services," which is now in hand, it is proposed to say that the execution of services by civil day labour directly employed by the War Department may be authorized by the Chief Engineer either simultaneously with or in substitution for the execution of such services under contract, provided that he is satisfied that efficiency and economy is thereby insured.—ED., *R.E.J.*

THE FYERS FAMILY.

(*Continued*).

By Col. Robt. H. Vetch, c.b., late R.E.

Lieut.-General William Fyers, Colonel Commandant, R.E.

(*Continued*).

Fyers was promoted to be Capt.-Lieutenant on the 20th April, 1787, and in October, 1788, he was sent from Gosport to Gibraltar. On his arrival there, he was posted to the command of a company of Royal Military Artificers. At this time he was a subaltern of 15 years service, half of them war service. It was not until 1793 that he was promoted to be Captain, and a brevet majority followed two years later. In 1795 he succeeded Major-General Robert Morse* in command of the Royal Engineers at the station. He became a Lieut.-Colonel in 1800 and a regimental Colonel in 1806. All this time, some 18 years, he spent at Gibraltar, and the story of his life is a history of the Rock and its defences. Even were the material to hand, it would be tedious to enumerate the details of this service, because, although Gibraltar was a centre in close touch with the naval and military operations taking place in the Mediterranean, it was itself unattacked. Some extracts from the reminiscences of his daughter bearing on her stay at Gibraltar may however be of more general interest. The MS. seems to have been compiled after her marriage, probably long after.

"I must have been in my third year when we landed at Gibraltar. The only distinct recollection I have is being in a large room in a house near the King's Bastion, which was crowded with packing cases. Some of them had been opened and there was a sad litter of straw about. . .

"My brother Edward and my sisters Anne, Arabella, Louisa, and Fanny were born at Gibraltar. Arabella, who died young, was named after Lady Boyd, the wife of Sir Robert Boyd,† the Governor, who was

* General Robert Morse, afterwards Inspector-General of Fortifications, and Colonel Commandant, R.E., was C.R.E. at Gibraltar from 1791 to 1795. He was promoted to be Major-General while serving there in 1793. See *Dictionary of National Biography*.

† General Sir Robert Boyd was second in command at Gibraltar under Lord Heathfield during the famous defence of 1779—1783, and in 1790 succeeded him as Governor. He died at Gibraltar and was buried in the King's Bastion in 1794. See *ib.*

her godfather. Edward was named after Prince Edward,* who was there with his regiment. The Prince was a frequent visitor at our house, and did the family the honour to stand godfather to the boy. I well recollect the bustle caused by the preparation of a splendid entertainment on the occasion of the christening in honour of the illustrious guest. My eldest brother Thomas, then about 8 years old, was a constant attendant at parades, and was much noticed by the Prince. When His Royal Highness came to the entertainment my mother was amused by his telling her he knew every dish she was to have for supper, and then he proceeded to go through the bill of fare. It came out that Thomas, after the parade that day, had been unable to keep to himself all the good things that had been provided, and disclosed them to his august friend. . . .

"How many names of well-known persons who were friends of my father at Gibraltar crowd in my memory:—Drinkwater,† who wrote the history of the siege and who assisted my father to lay the foundation of the magnificent garrison library at the Rock; General O'Hara,‡ and his dear, good aide-de-camp, Capt. Douglas, who used to tell us so many funny and amusing stories; Graham,§ Hutchinson, Doyles,¶ Philpot, Whitmore, the Marquess of Huntley,** Wemys,†† Lempriere,‡‡ and many others. We had also an extensive naval acquaintance. Among them was Capt. Elphinstone (Lord Keith), who always had a bed at our house when he chose to remain on shore, and it was with him that my father went for a tour in Spain. . . .

"The time was now approaching (1793) when my brother Thomas was to be sent to England for his education, for there were no English

* Prince Edward Augustus, Duke of Kent, grandfather of the present King, was born in November, 1767, and was therefore at the time (1791), when he was serving at Gibraltar, 24 years of age.

† Colonel John Drinkwater, afterwards Bethune, was a young officer in the 72nd Foot (Royal Manchester Volunteers) during the siege he chronicled; he went home after the siege, and exchanging into the 1st Royals returned to Gibraltar. He went with his regiment to Toulon in 1793, where he was Military Secretary during its occupation. See *Dictionary of National Biography*.

‡ General Charles O'Hara served in the American War. He was a Major-General on the staff at Gibraltar from 1787 to 1790, and became Lieut.-Governor in 1792. He was promoted to be Lieut.-General in 1793, and later in that year was sent to Toulon to replace Lord Mulgrave in command of the British troops there. In repulsing the attack by the French on Fort Mulgrave, General O'Hara was wounded and made a prisoner. He was taken to Paris and confined in the Luxembourg until August, 1795, when he was exchanged with General Rochambeau. He returned to Gibraltar as Governor, and after much suffering from complications caused by his old wound he died there in 1802. The memoir of him in the *Dictionary of National Biography* says that he proved himself a very active and efficient Governor. "His old-fashioned discipline was rigid, but just and fair, while his lavish hospitality and agreeable companionship made him generally popular." He was nicknamed the "Old Cock of the Rock," and in his Kevenhüller hat, with a double row of sausage curls projecting on either side, and his legs encased in big jack-boots, he affected (although a young man for his

masters in the garrison. He had been for some time under the care of the garrison chaplain, the Reverend John Hughes, but as he was intended for the Royal Engineers, it was necessary for him to go through a regular preparation for the examination on entrance to the Royal Military Academy. The mention of Mr. Hughes reminds me of a good turn that my brother did for his tutor. There were supposed to be two chaplains at Gibraltar, one for civilians and the families of officers, and the other for the garrison, to whom he read prayers every morning on the Grand Parade. He also visited the sick in hospital. Mr. Hughes was without an assistant, and was in fact doing double duty, and applied to the Governor for increased pay. This irritated the Governor, and at our house one morning he abused the poor man for what he termed his greediness. On this Thomas, who was present, looked up from his corner and said in a distinct voice 'The labourer is worthy of his hire.' General O'Hara was so much struck by the words and the serious manner of the child that he said: 'Well, my boy, Mr. Hughes shall have the additional allowance, and you have gained it for him.' Thomas* was sent home to his uncle, Mr. Thomas Fyers, then living in London, or staying with the constant friend of the Fyers family, General Whyte Melville. Endeavouring to find his uncle's residence, the boy wandered about until he was weary. At length a gentleman asked him if he had lost his way and what his name was; 'Thomas Fyers! Why that is my own name,' and he caught the little fellow in his arms. He was soon comfortably settled with his uncle, and later placed at a school at the

years in other particulars) the old-fashioned garb of Ligonier and Granby. See *Dictionary of National Biography*.

§ General Sir Thomas Graham, Lord Lynedoch, was aide-de-camp to Lord Mulgrave at Toulon in 1793, and was at Gibraltar with his regiment off and on from 1794 to 1798. See *ib.*

‖ General John Hely Hutchinson, Baron Hutchinson, afterwards second Earl of Donoughmore. See *ib.*

¶ There was quite a family party of Doyles at Gibraltar at the end of the 18th century; General Sir John Doyle was a brigadier there. He had served throughout the American War, and in 1793 had raised the 87th Foot, in which his nephew, afterwards Lieut.-General Sir Charles William Doyle, served, and in 1798–99 was doing duty as brigade-major at Gibraltar, while Colonel Sir John Milley Doyle was Sir John's aide-de-camp. See *ib.*

** George, 9th Marquess of Huntley, a captain in the 3rd Guards, raised the 100th Foot (afterwards the 92nd Foot) in the beginning of 1794, and went with it to Gibraltar.

†† General David Douglas Wemys, served with the 49th Foot in the American War, was promoted Lieut.-Colonel with the 18th Royal Irish, which he took to Gibraltar in 1797. He was employed as a brigadier-general on the staff at Gibraltar until 1802. See *ib.*

‡‡ William Lemprière, the traveller and medical writer, was an army surgeon at Gibraltar in 1789, when his services were lent to the Emperor of Morocco. He returned to Gibraltar in 1790, where he was lionized on account of his travels in Morocco, of which he wrote an account. See *ib.*

* Thomas Fyers got his first commission in the Corps in May, 1800. His uncle and namesake was the Treasurer of Malta, already referred to.

Blue Stile, Deptford, where they professed to prepare boys for the Royal Military Academy. . . .

"In 1793 the state of France was the chief subject of discussion at the Rock, and being with my mother sometimes when there were visitors, I was greatly interested in the conversation. I cannot express the horror I felt when I heard of the execution of the French King, and of all the subsequent cruelties and the barbarous murder of the Royal family of France. As many men-of-war were at this time constantly coming into the harbour to refit or obtain supplies, we knew something of importance must be going on. One day a neat compact chest was brought to our house, and we children were anxious to know its contents. It proved to be a canteen for my father. Then we heard that General O'Hara was going with troops on an expedition,* and that my father had asked to be allowed to go as a volunteer. The General however refused to listen to his entreaties, and told him that a soldier must go where he was ordered to go, but the father of a large family had no business to volunteer for a service of no little risk to which he had not been ordered. It was quite sufficient for him to remain at his post and be ready to act when called upon.

"We were very sorry when our kind friend, General O'Hara, left us, and we did not hear any news of him for some time. General Rainsford† was left in command of the garrison during his absence. General Rainsford was a most eccentric man and a firm believer in animal magnetism. He used often to send for my father and Capt. Dickens (afterwards Lieut.-General Sir Samuel Trevor Dickens, K.C.H., who died in 1847) to read long dissertations to them on the subject. . . . One day when they dined with him and were taking their places at table he called out to one of the company: 'Do not sit down in that chair, it belongs to Mrs. Rainsford. She comes in at the window over there and takes her meals with me every day.' Mrs. Rainsford had been dead many years. . . .

"When news arrived of General O'Hara, we heard he had lost an arm and been taken prisoner by the French, who treated him with great indignity. . . . French Royalist emigrants flocked to Gibraltar in considerable numbers for protection and safety. Many of them had not had time to secure a change of clothes, and were reduced to great necessity. Joseph, the German barber who attended my father every day, told him there was a family of rank—Capt. and Madame Cibon with one daughter—who were suffering much distress. They had first fled to Carthagena, accompanied by a faithful servant, Joseph, and his wife and child. At Carthagena the servant established an eating house, or cook-shop, and being a clever cook, succeeded in earning enough for the maintenance of all the party. But soon the Spaniards began to waver in their attachment to the French Royalists and to combine with the French and Dutch Republics against Great Britain. Then these unfortunates were

* He was going to Toulon.

† General Charles Rainsford was previously in the Coldstream Guards. He was a scientific man, a Fellow of the Royal Society and of the Society of Antiquaries, and dabbled in alchemy. See *Dictionary of National Biography*.

obliged to seek another asylum; the move to Gibraltar exhausted their slender resources, and they were reduced to the greatest extremities. Joseph reminded Capt. Cibon that on quitting Marseilles a casket had been confided to him by a friend which no doubt contained money or jewels, and he thought the emergency of the case should hold him excused if he opened it and made use of its contents. 'No,' answered M. Cibon, 'nothing shall induce me to break a trust imposed upon me, however great my sufferings may be.' The hairdresser told my father that Madame Cibon proposed to take a limited number of pupils and endeavour to earn something towards their subsistence, and perhaps be able to assist their man-servant in starting a cookshop in Gibraltar.

"On hearing this my parents resolved to send my sister Charlotte and myself to her daily for a couple of hours to learn French. Meanwhile it became known that the British Government intended to grant pensions to all the Royalist emigrants according to their rank and the number of their family. On learning these benevolent intentions, the Cibons refused to receive remuneration for the instruction of their English pupils, though of course the number, which consisted of three (my sister Charlotte and myself, and Anne, the daughter of Mr. Hawkins, of the Ordnance Department), was not increased. This was the commencement of my friendship with the noble-minded Madame Cibon, the benefit of which I felt throughout my life. . . .

"An exchange of prisoners at length liberated our friend, General O'Hara. How rejoiced we all were to see him again, and to find that the report of his having lost an arm was untrue. He had, indeed, been wounded in the right arm, but it had got well. On the occasion of his first visit to us, the chief subject of his conversation was the cruel manner in which he had been treated by the French during his captivity. He mentioned among other incidents being brought out daily on to a sort of balcony of the prison, having the 'bonnet rouge' placed upon his head, and being shown to the mob below as a monster of iniquity. Then he told us the mob would hoot him and pelt him with cabbage stalks and stale eggs. He was very angry at so many French people being in the garrison. My mother ventured to say that the emigrants were of a very different stamp from that of the mob at Toulon. But he only avowed that his blood boiled at the sight of a Frenchman, and his first measure would be to drive them all out of the place. Shortly after he heard that we children were attending at Madame Cibon's house to learn the French language, and my mother explained to him how it came about, and the noble conduct of the Cibons. He listened attentively, and when she had finished her story, he turned to my father and said, 'Fyers, give the poor devils 100 dollars (£20) for me.' My father gladly fulfilled his benevolent command, and nothing more was heard of driving the emigrants from the Rock. On the contrary, all the respectable families were invited to his evening parties. . . .

"Major-General Robert Morse had been the Commanding Royal Engineer at Gibraltar for some years, and in 1795 he returned to England, leaving his wife and daughters to follow later. When they followed him however the ship they sailed in was captured by the French and carried

into a French port, where I was told they were very badly treated. On General Morse's departure my father, as senior officer of the Corps at the station, became acting Commanding Royal Engineer, and was eventually confirmed in the appointment.

"I well remember our moving into the house appropriated to the Commanding Royal Engineer after Mrs. Morse and her daughters had sailed. It was a pretty place, built by General Sir William Green, and although we children enjoyed the bustle of the move, it was not without much regret that we left the old house, where we had lived for seven years. The 'new house,' as we called it, soon obliterated any regret for our old home, and I must describe it. The main street of Gibraltar is fairly wide, with lanes branching out of it on the mountain side, narrow and steep. Bell Lane, the quarters of the Royal Artillery, was to the left. Engineer Lane was narrow and dirty, and contained only two old houses. Midway down this lane were the large gates by which you entered our new premises; a rather steep ramp led to it; on the right hand of this ramp was a high wall, in which was a door giving access to a couple of rooms, which served as a cellar. The parterre was prettily laid out, the road wide enough for a carriage to drive round to the front door. A gate at the other end of the parterre opened out to a very steep hill, leading on the right to a portion of the Rock, enclosed in our demesne by a high wall, and on the left it descended to the stables and to the bombproof building, where, in case of need, the family might congregate in safety, and where also the valuable maps, plans, and models of the fortress might be stored in the event of a bombardment. . . ."

For some six years after the Fyers family had settled in the house of the Commanding Royal Engineer there is no information in the MS. At the end of that time the writer, who was in her seventeenth year, became engaged to be married to Mr. Cornelius Mann, then a lieutenant in the Royal Engineers and quartered at Gibraltar. He was the second son of Colonel Gother Mann, afterwards General and Colonel Commandant, R.E., and Inspector-General of Fortifications.

The remaining quotations from the MS. refer to the naval fight off Algeciras in 1801, of which the writer was a spectator, and to her marriage :—

"It was, I think, on the 6th July, 1801, that we were sitting at breakfast in a room which commanded a view of the bay and of a great part of the Straits, with the African coast and Cabrita Point in Spain, when my father, riding up, called to us. We ran out to the corridor, and he told us that English men-of-war were rounding Cabrita Point close in to the Spanish coast. . . . It certainly was a beautiful sight to see those magnificent ships, their white sails shining in the sun, and following each other at intervals. The breakfast room was soon deserted as we hastened to an eminence near the pluviometer, whence we had a perfect view of the town of Algeciras opposite and the whole of the coast on that side of the bay.

'The day was beautifully clear and fine. We were presently joined

by several officers of the Royal Engineers—Mr. Mann,* Mr. Jones,† and others. We were not kept long in suspense as to the intention of the British squadron, for the ships began firing against the French ships of war at anchor and at the Spanish forts at Algeciras. The fire of our fleet was warmly returned both from the French ships and from the Spanish defences, including the little island‡ opposite the town of Algeciras. With what intense interest was the scene watched from our side of the bay. Every soul in the place seemed to have congregated either on the Line wall or on the heights, and the murmur of so many voices came to us like the sound of the sea waves."

It may be as well to explain here that the French admiral, Durand Linois, had been sent with a squadron from Toulon, consisting of the *Indomptable*, 80, *Formidable*, 80, *Desaix*, 74, and *Muiron* frigate, 38, to effect a junction at Cadiz with a French and a Spanish squadron there, and that his squadron had been seen from Gibraltar on the 1st July, working against a strong N.W.W. Learning that Cadiz was blockaded by a superior force, Rear-Admiral Linois bore up for Algeciras, and on the 4th July rounded Cabrita Point about 10 a.m., in sight of the British 14-gun sloop *Calpé*, Capt. the Hon. George H. L. Dundas. About 5.0 in the afternoon Linois came to with his squadron in front of the town of Algeciras. Dundas at once despatched Lieut. Janvarin to inform Rear-Admiral Sir James Saumarez, commanding the blockading squadron at Cadiz. This squadron consisted of seven ships of the line—the flagship *Cæsar*, 80, Capt. Jahleel Brenton; *Pompée*, 74, Capt. Sterling; *Spencer*, 74, Capt. Darby; *Venerable*, 74, Capt. Hood; *Superb*, 74, Capt. Keats; *Hannibal*, 74, Capt. Ferris; *Audacious*, 74, Capt. Peard; and the frigate *Thames* and brig *Pasley*.

Sir James Saumarez received the news at 2 a.m. on the 5th July, and immediately started with his squadron, except the *Superb*, for Algeciras. Variable light airs and calms delayed him, but at 7 a.m. on the 6th, the *Venerable* leading, opened Cabrita Point and saw the French ships warping further inshore to get completely under the protection of the shore batteries that defended the road. The signal was made from the flagship to engage the enemy as the ships arrived in succession.

The road of Algeciras is open and shallow. It was defended by Fort S. Garcia, a mile and a-half to the S.E. of the town, and between Fort S. Garcia and the town was another work opposite Isla Verda, upon which was a battery of seven long 24-pounders; on the other side of the town, three-quarters of a mile to the north, stood the battery of San Iago, mounting five long 18-pounders, and

* Lieut. Cornelius Mann.

† Lieut. John Thomas Jones, afterwards Major-General Sir J. T. Jones, Bart., K.C.B.

‡ Isla Verda.

near this battery was Almirante Fort, or Tower. There were also 14 heavy gunboats.

The British ships, baffled by calms and light variable breezes, arrived at long intervals at the scene of action, and had to anchor in unfavourable conditions for attack to prevent their running aground. The *Hannibal* did get aground in trying to get into position to rake the French flagship, and eventually had to haul down her flag. There was a furious cannonade on both sides, but the British ships often lay exposed to the full effect of the fire from the Spanish forts and the French ships without being able, on account of the sudden calms, to bring a gun to bear on their enemy.

The MS. continues :—

"By the help of our glasses we were able to distinguish women and children climbing up the steep hills behind Algeciras to get out of the way of shot and shell. The smoke clearing away a little, we had the mortification of seeing that H.M.S. *Hannibal* had got ashore to the north of the little island and was of course *hors de combat*. The firing got heavier, and later on we were grieved to see H.M.S. *Pompée* disabled and being towed across the bay to Gibraltar Harbour, with her sails hanging covered with shot-holes. The loss of the help of these two ships and the damage done to the others were serious, and it was sad to see our squadron obliged to draw off greatly injured by the enemy's fire and make for Gibraltar.

"However, Englishmen are not the people to be disspirited by the first untoward circumstance. Sir James Saumarez, whose flag was hoisted on board H.M.S. *Cæsar*, Capt. Brenton, had the ship taken into port. She had suffered a good deal, but the repairs were begun at once and continued unremittingly."

The writer of the MS. does not say anything about what took place immediately after the action. The French admiral, Linois, while getting his grounded ships afloat, sent an express overland to Cadiz, imploring the Spanish and French admirals in Cadiz Harbour to come to his assistance before the British could get their ships repaired and renew the attack. Accordingly, on the 8th July, the Spanish admiral, Massaredo, with five Spanish and one French sail of the line, three frigates, and a lugger, came out of Cadiz Harbour and anchored in the outer road, ready for a start next morning. The movement was observed by H.M.S. *Superb*, cruising off the port, and when the combined squadron of Spanish and French ships sailed at daylight on the 9th, they were preceded by the British ships *Superb*, *Thames*, and the brig *Pasley*. Early in the afternoon the brig *Pasley*, with all sail crowded on, ran into Gibraltar with the signal for an enemy flying, and while the Spanish and French squadron was hauling round Cabrita Point, H.M.S. *Superb* and *Thames* anchored in the bay.

It was well understood at Gibraltar that the object of this

reinforcement was to convoy Linois and his ships safely to Cadiz, and nothing could surpass the exertions of the British officers and men to get the damaged vessels ready for sea. The *Pompée* was in too bad a condition to leave any hope that she could be got ready in time. Her crew was therefore employed to assist in the repair of the other ships. The *Cæsar* lay in the Mole in so shattered a state that the admiral gave her up also, and shifting his flag to the *Audacious*, intended to distribute the crew of the *Cæsar* among the effective ships. Capt. Brenton asked that his crew might remain in the ship as long as possible, which was permitted. Then informing the men of the admiral's intention, all hands agreed to work day and night. On the 12th, when the enemy began to move, the *Cæsar* was still in the Mole, but taking in powder, shot, and shell, and other stores.

At 1 p.m. on the 12th the Spanish ships *Real Carlos* and *Hermenegildo*, of 112 guns each, were off Cabrita Point, and the rest of the enemy's ships were nearly all under way. Then H.M.S. *Cæsar* began to warp out of the Mole, her band playing "Come, cheer up, my lads, 'tis to Glory we steer," and the military band responded with "Britons, strike home." At 3 p.m. the *Cæsar*, passing under the stern of the *Audacious*, re-hoisted the admiral's flag and made the signal for the squadron to weigh and prepare for action.

To return to the MS. :—

"The combined Spanish and French fleet, knowing how much disabled our ships were, took advantage of the state of affairs to sail away out of the bay. The melancholy part of the affair proved to be that many Spanish persons of rank, with their wives and families, thinking they could not find a safer opportunity of returning to Cadiz, went on board the Spanish three-deckers (the *Real Carlos* and *Hermenegildo*).

"Sir James Saumarez was determined not to let his enemy escape, and the same day that the Allies sailed away the British fleet followed them. We went to our old station near the pluviometer to see them sail. The Line wall was again so densely crowded that nothing but human heads could be seen. The *Cæsar* was taking in ammunition up to the very last moment. As she left a shout arose from the assembled multitude such as I never heard before or since. Never was so animated a scene. The British ships were watched until they had fairly got into the straits and were hidden by Cabrita Point, and no one settled to anything that day. Our house was full of visitors from morning to night discussing the pursuit and the possible fight which might be going on close to us, almost under our eyes, and the probability of success to our gallant Admiral.

"The garrison continued that Sunday evening in a state of nervous excitement and anxious expectation. Then between 11 and 12 o'clock at night loud explosions were heard and the straits were illuminated by lurid flames, which lit up so brilliantly the southern end of the Rock that we were told the officers on guard could see to read by the light. . . .

"The next day passed without any news from the fleet or explanation of the explosion and fire. At length on the 14th July, to the joy of the

garrison, the British squadron, entered the bay, bringing with it a prize. Again the crowd collected on the Line wall and the cheering was deafening. The ships were soon anchored, and the Admiral and his flag-captain came ashore. All the boys in the place followed them cheering and hurrahing. Sir James said he felt more grateful than he could express for his reception, for he knew that the cheers came from the heart. He and Capt. Brenton paid us a visit and sat a long time with us, and it may be easily imagined with what interest we heard all the details of the engagement.

"The fight had already begun when Capt. Keats, in the *Superb*, charged in between the French and Spanish three-deckers, and giving each a broadside passed on and engaged another ship. The unfortunate three-deckers, fancying in the dark they each had their enemy between them, blazed away at each other until they both took fire, burnt for some time, and then blew up. Then, indeed, there was an awful and distressing scene, poor wretches swimming for their lives, crowding into boats, laying hold of any floating spar or other article to escape being drowned.

"The English did their best to save as many as they could of these poor creatures, who afterwards spoke loudly in praise of the humane attention they had received from their enemies. . . ."

The above account of the engagement differs a little from that given in James's *Naval History*. There it is related that, the British squadron being in chase at 8.45 p.m., the Admiral hailed the *Superb* close astern of him, and directed Capt. Keats to make sail ahead and attack the enemy's ships, none of which were then visible. Immediately all sail was set in the *Superb*, and at 11 p.m. she was 3 miles ahead of the flagship. Shortly after she observed a Spanish three-decker (*Real Carlos*) about a point before her port beam, and a three and a two-decker (Spanish *Hermenegildo* and French *S. Antoine*) in a range with and on the port side of the former. The *Superb* shortened sail, and when about 300 yards from the *Real Carlos*, opened a broadside fire upon her. At the third broadside the *Real Carlos* was on fire, and the *Superb* ceased engaging her. Shortly after the *Real Carlos* came suddenly to the wind, and then drifted astern in evident confusion, she and her two nearest companions firing their guns in all directions. At about 12.15 a.m. on the 13th the *Real Carlos* blew up, but not until she had fallen on board of and set in a similar blaze the *San Hermenegildo*, who, having in the dark mistaken the *Real Carlos* for a foe, had been engaging her, and in another quarter of an hour the *Hermenegildo* also exploded. As the British squadron came up the *S. Antoine* surrendered.

It blew very hard during the night, and the pursuit of the rest of the combined squadron continued till daylight, when the wind fell. H.M.S. *Venerable* and the French *Formidable* were then engaged in a desperate conflict, but the former got on a shoal some 12 miles south of Cadiz. At 8 a.m. the *Cæsar* came up, and the *Audacious*

and *Superb* following, the Spanish Admiral hauled up for Cadiz, where his ships were soon safely moored. Fortunately the weather continued calm, and the dismasted *Venerable* was got off the shoal and taken in tow by the *Thames*. The squadron got into Gibraltar on the 14th with the *S. Antoine* as a prize. Sir James Saumarez and his officers and men received the thanks of Parliament, and the Admiral was made a K.B. and granted a pension of £1,200 a year.

The day following the return of the fleet to Gibraltar after the victory was held as a day of rejoicing, and the victory was celebrated in many ways during the day and by illuminations at night. Now it so happened that this very day had been fixed some time before for the marriage of Miss Sarah Fyers to Lieut. Cornelius Mann, R.E. The lady writes of this :—

"As there was a special license for my marriage, the wedding took place in our drawing room in the evening. All the candles and lamps in the house were lit on account of the illuminations for the victory, adding not a little to the heat of a July evening at Gibraltar. The Governor, General O'Hara, had asked my father to allow him to give me away, and came attended by his aide-de-camp. General Wemys was also present and Capt. Brenton, R.N., who brought me a present from the Admiral, who was not well enough to come. Among the many friends present were my excellent governante, Madame Cibon, and her daughter. The Garrison Chaplain, the Rev. J. Hughes, performed the rite, and at the supper which followed General O'Hara made a fine speech to my husband."

After the conclusion of peace with Spain, Mrs. Mann writes :

"Capt. Brenton came to our quarters, which were close to my father's, begging us to go with him to Algeciras to call upon the Spanish Governor. We formed a pretty large party; besides my husband and myself, there were my pretty sister Charlotte[9] and Nanna Cibon, who was staying with us, dear Madame Cibon having died shortly after my marriage. We had a very pleasant row over, and were received by the Governor with the greatest civility. He walked about the town with us, and showed us the places where the houses had been struck by the shot and shell from our fleet, for although they had been repaired, the fresh brickwork made them very conspicuous. We accepted his invitation to dinner. He apologized for the want of time preventing him having the dinner in the English fashion, but that he had ordered that no garlic should be put into any of the dishes. We had an excellent dinner.

"During the war our ships used to be seriously annoyed by little Spanish gunboats. These boats used to come close under the English ships as they were entering the harbour and fire away without the ships being able to bring any of their guns to bear on them. There was one man especially who commanded one of these little boats who used to single

[9] Afterwards wife of Vice-Admiral James Young, of Barton End, Gloucestershire.

out a ship Capt. Brenton was cruising about in, and the encounters were often very serious affairs. This man was admired, not only for his skill, but for his bravery and daring. After dinner Capt. Brenton enquired about the man and expressed a wish to see him. He was sent for, and was not long in making his appearance. He was a rough, weather-beaten looking man in the dress of a common sailor. He entered the room with a timidity one would hardly have expected from so brave a man. Capt. Brenton however soon reassured him. He rose from his chair, and advancing to meet the man, shook him heartily by the hand, told him he was a brave fellow, and that as they had often fought together they ought now to drink a glass of wine together, which they did, hob-nobbing in the old-fashioned style. It was curious to observe the sudden change in the man's countenance when Capt. Brenton received him so cordially. Indeed, all the Spaniards present seemed surprised at the condescension of the English captain, and his taking notice of the gunboatman from whom he had received so many injuries.

"We spent a delightful day and returned to the Rock in good time, but, alas, a lecture from my mother was awaiting me. In my ignorance and thoughtlessness I had left home in the morning without ordering dinner for the servants, and they had gone to make their complaint to my mother, who allowed them to join her own servants.

"Some months after the peace I took into my service an active young Spanish girl named Johanna, who was living at Algeciras at the time of the engagement in the Bay. She was able to give me an animated account of the consternation occasioned in the town by the appearance and attack of the British fleet. She said that all the families that could leave the place took shelter in the mountains. They rejoiced greatly in what they took to be the victory gained over the English, but the later encounter in the Straits was not known until long afterwards, she said.

"The *Cæsar* was stationed at Gibraltar for some time after the establishment of peace, and many excursions we had with Capt. Brenton and other officers of the Navy to the Cork Woods. Capt. Brenton, with my husband and Mr. Jones, rambled over the most difficult parts of the Rock, visiting caves which few had entered, and Capt. Brenton gave me some interesting sketches he had made of the interiors, especially of one which from its dangerous access was called 'Madman's Cave.'

"Soon after my marriage our dear old friend, General O'Hara, was seized with a serious illness, so that he was not able to sign my marriage certificate, which Mr. Douglas, the aide-de-camp, had delayed making out longer than he ought to have done. After many months of severe suffering he passed away, and we had to lament the death of our oldest and best friend."[o]

[o] Here the MS. ends. Sarah Mann survived her husband some years, and died at Brinstead, Isle of Wight, on 6th September, 1846. Their family was a large one.

(To be continued).

TRANSCRIPT.

THE FINAL STRUGGLE FOR 203-METRE HILL AT PORT ARTHUR.

Translation of an article by Staff-Capt. Kostiushko in the March, April, and May numbers of the *Ezenzhenernee Zhoornal.*

One of the most brilliant episodes in the Defence of Port Arthur, and incidentally in the military history of the 5th East Siberian Rifle Regiment, was the 10 days' fighting in November and December, 1904, on the position called by the Russians Visokaya Hill. This position received two separate attacks from the Japanese in September, from the 21st to the 24th inclusive, and again from the 28th November to the 6th December. In September the Japanese were repulsed by the heroic action of certain distinguished individuals; in November and December countless brilliant actions were performed, but the Russians did not succeed in holding the hill.

The September fighting has been described often, and its details are fairly well known; all that is known about the second attack is that the Japanese pulverized the hill with 11″ shell, and after a desperate resistance took it; but of the details of the defence, how it was carried out, to whom the credit for such obstinacy is due, what heroic deeds were performed in the course of the 10 days' struggle, and by whom, little is known. Even in the Court of Enquiry on the Defence of Port Arthur, when less important events which occurred on the right flank were described in great detail, scarcely a word was said about the final struggle for Visokaya Hill, although it was this fighting particularly which brought about the fall of the fortress.

With the desire therefore of doing justice to the gallant, but hitherto forgotten, defenders of Visokaya Hill, it is proposed to describe in comparatively few lines the events which occurred on each day of this historic struggle, and to dwell at greater length on the noteworthy incidents and heroic deeds of individuals which occurred during the fighting.

It may be allowed with justice that each of the general officers concerned in the defence sought out every device and used every endeavour to keep the hill. General Kondratenko always watching the fight personally, and so attentively that nothing escaped him, sending up in good time reinforcements, food, grenades, cartridges, in fact, everything that was necessary; General Irman almost daily visiting the hill, and by his reckless bravery, better suited to the ardour of youth, encouraging and charming all; and General Stessel carefully following

the fighting, at the critical moment placing General Tretyakov in immediate charge of the defence, cheering the troops with kind messages and rewarding on the spot those who distinguished themselves. In a word, each did what he could, but the heaviest and most difficult part, and at the same time the most important, the immediate responsibility for the defence, fell to General Tretyakov, the commandant of the 5th East Siberian Rifle Regiment, who remained on the hill for six days continuously, again and again leading the troops to the attack, by his personal skill doing great deeds with small numbers, and repeatedly repulsing an enemy who outnumbered his men fully ten times over.

But in publishing the present account one reservation is necessary. The reader must not imagine that it is either perfect or complete; he must understand that, in addition to the whole of the 5th Regiment, many other troops took part in the defence, combatant, non-combatant, and composite companies of other regiments, sailors, town guards, and hospital detachments. In a word, all who were found alive in Port Arthur, and could handle a gun, were collected by Stessel and Kondratenko, and despatched to Visokaya Hill. Consequently, from first to last, there were on this ill-fated hill representatives of not less than 80 different companies and detachments. In some cases even parties of a few men each were joined together in twos and threes, and were sent off to the hill, where they melted away with appalling rapidity and were seldom heard of again. It is, consequently, exceedingly difficult to fix exactly when certain companies were on the hill, and how they were disposed, and to obtain all the information necessary for a complete and accurate description of the fighting. In an earnest desire to give full credit to all, the writer has supplemented his personal observations with information obtained from various reports and from the evidence of others who were present, and, consequently, if any errors or omissions are to be found in this account, they were certainly not premeditated.

Furthermore, he feels sure that it would be difficult to find a more accurate account of this historic fighting, or anyone better qualified than himself to make it out, for the following reasons:—

(i.). That through him as Adjutant, 5th East Siberian Rifle Regiment, almost all the reports and orders affecting the section attacked passed.

(ii.). That the descriptions of the fighting sent in subsequently by the companies of the 5th Regiment also passed through his hands.

(iii.). That, not satisfied with these official details, he also collected many statements from men who took part in the fighting, and

(iv.). That he himself also took part in it.

DESCRIPTION OF VISOKAYA HILL AND ITS DEFENCES.

The town of Port Arthur consisted of two parts—the western, called the New Town, and the eastern, called the Old Town.

On the north-west of the New Town there lay a low ridge of hills called the Jagged Hills.

The highest point of this ridge attained an elevation of 700′ (203 metres)

and lay about 2 miles from the New Town in the direction of Louisa Bay, *i.e.*, west-north-west,

Its two-pointed summit and very steep sides gave it the appearance from a distance of a two-humped camel. The Russians called it "Visokaya" (great), and the Japanese "203-Metre Hill."

The approach to Visokaya, and also to Flat and False Hills, lay along a ravine named after the tea house of the 11th Regiment, which was built before the war, at the north-west extremity of the New Town, in the mouth of the ravine. Being well covered along its whole extent by low but generally steep hills, and therefore well suited for the concealed movement of troops, the Tea Ravine formed a safe approach to the very foot of Visokaya Hill, which itself protected it on the third or western side. This ravine in places attained a width of 100 paces, but it was generally considerably narrower. A cart road leading to Visokaya Hill ran along it.

Visokaya Hill attracted notice as being a fine and naturally strong position. It was higher than all the neighbouring hills except Lyaoteshan, and commanded both the surrounding country and also the forts of the centre and eastern fronts of Port Arthur. It was undoubtedly the tactical key of the west front of the land defence, and to a certain extent that of the whole Port Arthur position.

Besides this a wide view could be obtained from it in all directions; many of the buildings of the Old Town could be seen from it, while the whole extent of the Tea Ravine, the whole of the New Town and the inner roadstead where the fleet had taken shelter, lay at its feet.

On the 4th June, 1904, the whole extent of the Jagged Hills, which included Division, Three-Headed, Side, Forward, Angle, Saddle, Deadly, Long, Flat, Visokaya, False, and Intermediate Hills, was placed under the command of the commandant of the 5th Regiment, and not till then was their fortification taken in hand seriously.

Previous to this Staff-Capt. Smirnov, of the Fortress Sapper Company, had begun a trench low down the front slope of Visokaya. On the left it had been excavated deep enough to allow of firing in the kneeling position, but on the right it was only marked out. In addition to this trench, Smirnov intended to put a battery for two 6″ guns on the right peak, and as the surface of the hill near the summit consisted of an almost naked slope of quartz, he hired Chinamen to collect earth at the foot and carry it up the hill in baskets on small donkeys. But though 50 men were thus employed daily, the work made little progress.

When Colonel Tretyakov took over charge, he reconnoitred the hill with Capt. Stempnevski I., Staff-Capt. Belozerov, Lieut. Gleb-Koshanski, and other officers of his regiment, and decided that Capt. Smirnov's trench was useless, as it was too wide, had no traverses, and was placed so low down the hill that it was commanded by several hills which were considerably lower than Visokaya. It was therefore decided to make a new trench considerably higher up, and to use the old trench as an obstacle.

The 2nd and 4th Companies, 5th Regiment, were detailed as working parties, and these formed the original garrison of the hill. Capt. Stempnevski I., of the 2nd Company, was made commandant. Henceforth the work proceeded briskly, the men working with pick, crowbar, and shovel each day, from 6 to 11.30 a.m., and after dinner from 2 to 7 p.m. Stempnevski was the first to reach the hill each day and the last to leave it at night, and after 4th August he stayed there altogether.

Colonel Tretyakov, when riding round his section once and often twice a day, usually spent a long time on Visokaya Hill and paid special attention to its fortification. General Kondratenko also came there fairly often, and was well pleased with the rapidity and excellence of the work. The advice and directions of these senior officers were keenly and skilfully applied by Stempnevski. The men worked unceasingly on holidays and working days, in spite of rain, heat, and weariness, and by August had completed the following works :—

(i.). A ring trench, 3,500′ in length, of a profile suitable for firing standing in the bottom of the trench, with traverses, strong blindages, and hoods in many places. Owing to the great steepness of the hill, it was found that a parapet would render it impossible to sweep the slopes with fire, and would help to form dead ground. At first one was made, but later on it was removed and the trench excavated deeper. Some idea of the difficulty of this work can be formed when it is understood that it was all excavated with pick, crowbar, and shovel only.

(ii.). On the left flank, between Visokaya and False Hills, Capt. Smirnov's lower trench was converted into a ditch of considerable width and depth; but the rest of it, for want of labour and time, was simply brought under fire from the upper trench by ramping its rear slope, so that the enemy could not take cover in it.

(iii.). On the right peak the battery was completed and armed with two 6″ guns.

(iv.). On the saddle a battery was made for two field guns.

(v.). On the reverse slope of the right flank (heavy gun) battery a magazine was excavated.

The artillery on Visokaya Hill was used only in August. At this time the field guns were so overpowered by Japanese shells that they had to be removed, and were seen no more on Visokaya Hill. Of the 6″ guns, one was put out of action and the other had its carriage damaged, but they were not taken away, although they were of no use on Visokaya (for they could only fire at long ranges), as this would have required many men for whom more useful work could be found elsewhere. And so they were left on the hill, and even in their damaged state are said to have fired a few rounds in the September fighting.

After August the fortifications were improved, blindages and hoods were strengthened, and fresh ones were made (see *Figs.* 1 and 2).

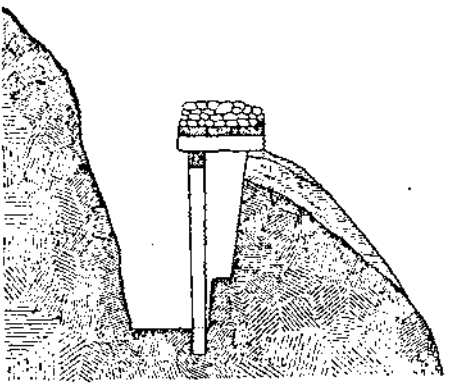


FIG. 1.—*Original Hood.*

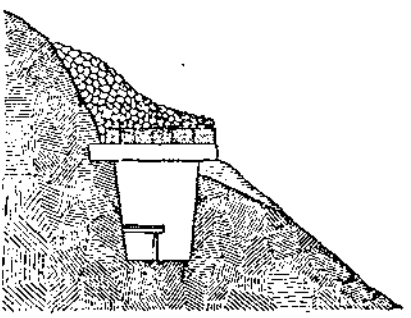


FIG. 2.—*Original Blindage.*

From the 21st to 24th September the Japanese assaulted Visokaya and Long Hills; they took the latter, but were repulsed from Visokaya with enormous losses. The steep slopes of the hill were thickly strewn with Japanese corpses, and it took five or six nights to gather in the slain. Some of the corpses, which are said to have numbered 1,761, were carried down the reverse slope for burial, and with the rest they filled Smirnov's trench, which they afterwards covered up with earth.

The September fighting revealed certain faults in the blindages and hoods. The latter had too large loopholes, so that in some cases men using them were even struck by shrapnel bullets. The blindages were not really proof against the shells of field guns, while 6″ shells completely destroyed one and seriously damaged four others.

This experience was made good use of, and by November the blindages were greatly strengthened. Each crossbeam was propped in the middle

with an 8″ upright (see *Fig.* 3), and on the roofs were laid steel plates, about $\frac{1}{2}$″ in thickness, which were obtained by the sailors, or a row of rails laid flat, and in two or three cases a double row of rails laid upright. Above this was placed a layer of stones 14″ to 28″ in thickness. Thus strengthened the blindages were proof against 6″ and even against Shimoze shells.

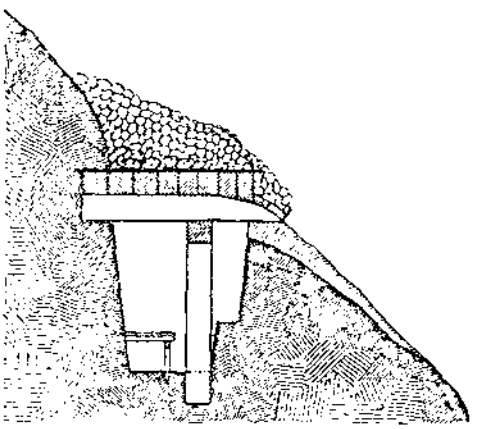


FIG. 3.—*Improved Blindage.*

The hoods were also improved (see *Fig.* 4), so that the men could no longer be struck by shrapnel bullets through the loopholes.

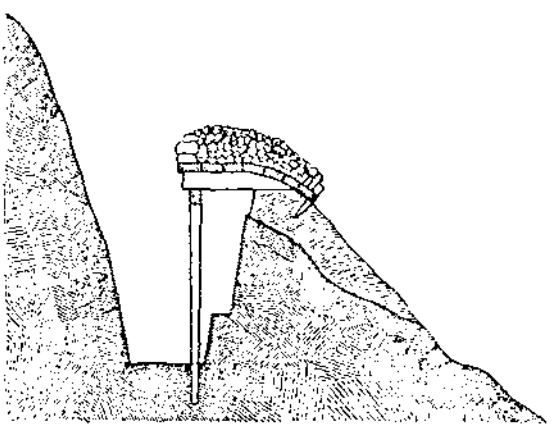


FIG. 4.—*Improved Hood.*

The September fighting also showed the necessity of fortifying the left peak with a redoubt. In spite of the fact that this peak consisted of a smooth rocky slope, yet by November a strong redoubt had been excavated there, with a trench 7′ deep and 42″ wide, provided with traverses and blindages, of which a specially strong one was provided in

the centre for the commandant. The roof of this blindage was protected by a double layer of rails and 42" of stones, and apparently it was not wrecked even by 11" shells. Communication trenches led into this blindage from both sides.

The battery on the right peak was also converted into a redoubt, and was connected with the left peak by a trench, in depth equal to a man's height. This trench passed through the field gun battery, and here its profile was made suitable for firing, standing, from a step.

The ring trench was also strengthened to this profile. Around the ring trench, at a distance of 20 to 60 paces, according to the ground, was made a wire entanglement, and another was made above the ring trench, at 15 to 20 paces in front of the left redoubt. Each was about 14' in width, but the upper one was further strengthened by abattis, which was brought up from the original position, which lay between Forts Nos. 4 and 5.

For use in bringing up reinforcements, and thus reducing losses, the following communication trenches, which varied in depth from 6' to 7', were excavated:—Two to the trench connecting the two peaks, one from the trench in the right battery towards the magazine, and one, blinded, from the connecting trench to the front part of the ring trench.

By November the garrison of Visokaya Hill consisted of the 2nd, 4th, and 6th Companies of the 5th Regiment, the 7th Company, 14th Regiment, and the 4th Company, 15th Regiment. One company was given a rest each day.

Work went on uninterruptedly and especially by night. Some of the men were employed in dragging up the hill beams, joists, planks, rails, steel plates, bags, etc.; others not only carved the rock with picks, crowbars, and shovels, but also blasted it out with *rak-a-rok*, which greatly helped on the work. A special Sapper officer was detailed to superintend.

General Tretyakov, as before, visited the hill daily, and sometimes twice a day. He chiefly gave advice and orders for carrying out fresh work. Other senior officers also came, notably Generals Irman and Kondratenko. During October and November Colonel Dubitski, the engineer, also came. All gave valuable advice, and Colonel Dubitski also usefully accelerated the delivery of building materials and tools.

As the garrison of the hill could not supply sufficient men to cope with this tremendous work, parties were daily sent from certain companies in the reserve, and when none of these were available, men were brought from the less important posts, and sometimes even from False Hill.

As an example of the care with which the command on Visokaya Hill was managed, it may be mentioned that water for the positions was drawn from a well at the headquarters of the 5th Regiment, and was transported by night in barrels, and in other parts was carried up the hills in buckets arranged for that purpose. But at Visokaya a steam pumping plant was installed, by which the water brought up in barrels was driven up the hill.

Several men of the garrison, finding how rapidly the rock could be excavated with *rak-a-rok*, set to work to excavate for themselves caves in the rock. One of the best caves belonged to Staff-Capt. Olander, commanding the 4th Company, 5th Regiment. Excavated at the bottom of

the rear side of the trench, this cave formed a long narrow room, in height equal to the height of a man. The electricians also had a cave, and also some of the sergeant-majors, while others were made in several blindages.

The 11″ shells were unable to wreck these caves, but could and did block up their entrances.

These caves showed that it is possible to excavate in a hill not only roomy and safe shelters for supports, but also tunnels leading to threatened points. Between June and November there would have been plenty of time to do this, but unfortunately the *rak-a-rok* was thought of too late.

II.—Works on False, Flat, and Division Hills and the Original Position.

False Hill, which had been entrenched by its own garrison since May, stood to the left and somewhat behind Visokaya. At the time of the August fighting its works consisted of shallow trenches, and on its summit had been placed two spars, the tarred ends of which projected outwards, and were intended to look like the muzzles of guns. It was hoped by this means to deceive the enemy and make them uncertain as to whether the firing was carried on from here or from Visokaya, and from these false guns the hill received its name.

During the September attack this hill brought a flanking fire to bear upon the Japanese and contributed largely to their repulse.

By November its works took the form of a redoubt, with profile for firing standing from a step, provided with traverses and blindages. The blindages were practically the same as those on Visokaya had been in September. Warming places were provided at intervals in the rear slope of the trenches.

The works on Intermediate Hill were of equal strength to those on False Hill, and were shaped like a wide lunette—a trench with bent-back flanks.

Flat Hill lay to the right of Visokaya, and was occupied after the fall of Long Hill on 22nd September. Its defences were not begun till after this date, but nevertheless by November it had been provided with a trench, on the left flank in two tiers, for firing standing from a step, with traverses, hoods, and warmed shelters; and on the summit was placed a redoubt, named Stony Redoubt, of similar profile to the trench and provided with traverses and hoods. In the redoubt there were strong blindages for the company and a separate one for the commander. These were made by covering over a trench with two layers of beams and laying about 28″ thickness of stones on the top.

Flat Hill flanked the approaches to Visokaya, and its preservation was essential to the safety of the latter.

Division Hill (between Flat Hill and Fort No. 4) was so named because it was intended to put a division of field artillery there, and was actually used for this purpose in August, emplacements having been provided meanwhile. By November it was entrenched as strongly as False Hill, but special attention had to be paid to its vulnerability from the left flank, and its trenches were therefore divided into sections, and two subsidiary trenches at right angles to the main ones were provided.

The line of works between the Forts Nos. 4 and 5, *i.e.*, Two-Angled and New Lunettes, Fougasse Knoll, Red Hill, etc., are called the "original position," because up to May, 1904, it was the only line prepared for defence in this section. It was made by the engineers probably at the same time as the forts, and as a position was far from satisfactory, either from a tactical or from a fortification point of view. It was protected by trenches of profiles in places suitable for firing standing from steps and in places for standing in the bottom of the trench, with traverses only in places and light blindages.

In all the defences the firing positions were provided with loopholes under the hoods. So long as the Japanese remained at a distance these loopholes were satisfactory, but by October, as the Japanese advanced their saps, the 8″ to 10″ openings became dangerous, and many men using them received fatal wounds in the head. This was afterwards counteracted by hanging curtains behind the loopholes and raising them cautiously when the latter were occupied for firing.

One day the troops returning from a successful sortie brought back a Japanese loophole plate, made of ½″ steel, with a cross-shaped opening in the middle for convenience of aiming and firing.

At the request of General Tretyakov, Colonel Dubitski prepared some plates of slightly modified design for the Russian trenches. These plates were rectangular, 8¾″ in height, and a little less in base measurement, while the vertical slots in the cross-shaped openings were made somewhat longer than in the Japanese plates, to give greater freedom in firing down the steep slopes of the hills. In all, 100 of these plates were supplied, of which 75 were allotted to Visokaya and 25 to Division Hill.

The fact that the openings on these plates were very difficult to hit induced greater steadiness in those using these loopholes. The men also took to protecting the loopholes for which there were no plates with stones. By this means the size of the loopholes was reduced, but not to the same extent as with the loophole plates.

Previous to the September attacks a mining apparatus had been established on Visokaya, but it proved useless, as it was put out of action by the first shells, and was afterwards taken away.

There were four machine guns on Visokaya and two more on Flat Hill. The mountings were found to be very bulky and inconvenient, and the men threw them away and rested the guns directly on the parapet. This not proving quite satisfactory, a trough was designed by Ensign Ermakov, from which the guns worked splendidly. All the same, the machine guns on Visokaya were of little effect, as they were all put out of action by the 1st December, and took no part in repelling the final attacks.

After their ill-success in September, the Japanese advanced against Visokaya Hill (in every sense a *field* fortification) by patient sapping, and by the time of the November assaults had obtained the following results:—

(1). A sap, with two heads, on the left flank of Visokaya, clearing the wire entanglement, had arrived within 30 paces of the ring trench, and ended in a parallel.

(2). A sap in the centre had arrived within 150 to 200 paces of the ring trench.

(3). A sap on the right flank of Visokaya had arrived within 150 to 200 paces of the ring trench, and ended in dead ground, formed by the steepness of the hill at this point. From here the Japanese could get to the trench safely, but to reach it they had with great difficulty to scale the almost perpendicular cliff. This dead ground proved very treacherous to the Russians.

And lastly (4), a branch from this last sap came within 150 to 200 paces of the trenches on Flat Hill.

A sap was also driven against the left flank of Division Hill, but as this attack was not pressed it is unimportant.

III.—Garrison and Command.

The garrison of Port Arthur consisted of the following units:—

5th E. Siberian Rifle Regiment (detached from the 4th E. Siberian Rifle Division) of 11 companies (the 12th formed part of the Consular Guard in Pekin), and mounted volunteer detachments.

4th E. Siberian Rifle Division, commanded by Lieut.-General Fok—13th, 14th, 15th, and 16th E. Siberian Rifle Regiments, each of 12 companies, and 1 mounted volunteer detachment.

7th E. Siberian Rifle Division, commanded by Major-General Kondratenko—25th, 26th, 27th, and 28th E. Siberian Rifle Regiments, each of 12 companies.

3rd E. Siberian Rifle Reserve Battalion—4 companies.

4th " " " " 4 "

7th " " " " 4 "

At the beginning of the war each regiment was made up with reservists to approximately 3,000 men. As the companies were considered overcrowded, it was decided to separate out the volunteer detachments, to form one, two, or three *foot* volunteer detachments, according to the number of battalions in each regiment.

A sotnia of the 1st Upper Udinsk Cossack Regiment.

4th E. Siberian Rifled Artillery Brigade—4 8-gun batteries.

7th " " " " 3 " and fortress artillery.

The Commander-in-Chief at Port Arthur was General Stessel, commandant of the Kwantung fortified rayon. His second in command was Lieutenant-General Smirnov.

The defence of Port Arthur was divided into two main sections—sea and land. The latter was entrusted to General Kondratenko.

The line of land defence was divided into three parts:—(1), The Eastern Front (right flank); (2), Northern Front (centre); and (3), Western Front (left flank), from Fort No. 4 to Pigeon Bay inclusive. The commander of the Western Front was Colonel Irman, commanding

4th E. Siberian Rifled Artillery Brigade. His section was divided into divisions, and the commander of the 1st Division was Colonel Tretyakov, commandant of the 5th Regiment. Colonels Irman and Tretyakov were of equal rank, Tretyakov being senior as a colonel and Irman senior as a brigadier. Both were promoted major-generals in October, 1904, but they were unaware of the fact and earned their fame in this fighting as colonels, and not as generals.

In the 1st Division were included the following positions :—

1. Fort No. 5.
2. The line of trenches in the Original Position between Forts Nos. 4 and 5.
3. Everything in rear of this as far as the New Town.
4. The Jagged Hills lying to the front, of which in November there were occupied :—Division Hill, Flat Hill, Visokaya, False, and Intermediate Hills, each of which had its separate garrison and commandant immediately under the orders of General Tretyakov.

The staffs were designated as follows :—

General Stessel's Staff	The Rayon Staff.
„ Smirnov's Staff	The Fortress Staff.
„ Kondratenko's Staff ...	The Land Front Staff.
„ Irman's Staff	The 5th Regiment Staff.
„ Tretyakov's Staff... ...	

This last staff was located in the Tea Ravine, in rear of Fougasse Knoll. The rest lived in the town.

Urgent reports and orders were sent by telephone. The 5th Regiment Staff had four telephones :—(1), To Fort No. 4 and Entrenchment No. 4 ; (2), to the town ; (3), to the positions on Visokaya, False, Flat, and Division Hills ; and (4). wandering.

For discipline, the 5th Regiment was under the orders of Generals Irman and Tretyakov, but for supply it was under General Fok, as commandant of the division to which the regiment was attached. This led to considerable inconvenience.

The first commandant of Visokaya, as already mentioned, was Capt. Stanislav Julianovich Stempnevski I., commanding 2nd Company, a man in the highest degree hardworking, painstaking, and brave. His service on Visokaya Hill presented a continuous round of courage, hard work, and privation. His work was repeatedly noticed in orders during August and September by Generals Kondratenko, Irman, and Stessel.

Visokaya Hill, as already mentioned, was a most important position and required a commandant who should be always on the *qui vive*, always prepared to resist the enemy. Such tension, combined with the constant danger and anxiety over the fortifying and guarding of the hill, greatly affected the commandant, especially during the fighting. In consequence of this, and although he knew him to be always brave, energetic, and cool-headed, General Kondratenko decided to appoint a second officer,

who should share the command with Stempnevski, each holding it in turn for a period of 48 hours.

The 5th Regiment always did their best to merit the special consideration and trust which General Kondratenko placed in it, and which the dead hero repeatedly expressed to the regiment, and of which the latter was very proud. Referring to the choice of a second commandant of Visokaya Hill, he said: "I wish both commandants and not less than half of the garrison to be from the 5th Regiment." Though he well knew that in the preceding battles the regiment had lost more than 30 officers, killed or died of wounds, that the companies were all commanded by lieutenants, sub-lieutenants, and even ensigns, and that consequently there was no great choice, and though he recognized the inconvenience of subordinating commanders of companies which came to join the garrison of the hill, sometimes grey-haired captains of other regiments, to a commandant of half their seniority from among the company commanders of the 5th Regiment, yet General Kondratenko remained firm in his opinion and repeated: "The 5th Regiment are all heroes! I demand that both commandants and not less than half the garrison shall be of the 5th Regiment. Then I shall be content."

At first Capt. Stempnevski was relieved by Staff-Capt. Sichev, commanding the 6th Company, during the September fighting. After two days' struggle, the 2nd Company (Stempnevski's) had lost three-quarters of its strength and presented a mere handful of exhausted men, half of them wounded, and urgently requiring relief and rest. While considering the men it was impossible to overlook their commander. The 6th Company was sent up, and their commander, Sichev, took up the command of the hill. The Japanese were repulsed, and Sichev was decorated with the 4th Class of the Order of St. George.

From the 23rd September to the 31st October the relief of commandants was carried out regularly every two days.

Having taken up the command on the latter date, on the 2nd November Stempnevski refused to be relieved until the Japanese, who were attacking the hill on that day and the day before, should finally leave the place. The reason for this refusal was that in the previous fighting Stempnevski had been on the hill and had taken an active part in repulsing the Japanese, and together with Sichev had been recommended for a decoration. But General Fok had struck out his name, probably because he had been relieved during the fighting. Stempnevski was much hurt, and looked forward to the next attack on the hill to prove himself worthy of this high reward.

On hearing of his resolve, General Tretyakov informed him by telephone that he never doubted his courage, and that this was confirmed by his nomination as commandant of the hill, and that his resolve would be reported to the proper quarter.

On the 3rd November Sichev was wounded, although only slightly, by splinters of a shell which burst in the New Town, and was unable to relieve Stempnevski. In his place there was detailed an exceedingly gallant officer, Staff-Capt. Belozerov, commanding the 3rd Company, who had gained distinction in the previous fighting for courage and

presence of mind. Thus in the retirement from Kinchow, while moving by night through a narrow gorge in the Mid-Arthur road, disorder arose in the baggage train from the unfounded rumour that the Japanese cavalry were following in pursuit. At the same time the inhabitants of Dalny began to join the column, bringing their possessions in Chinese carts. The more panic-stricken of these, trying to push forward in the narrow road, began falling down themselves and knocking down others, so that the whole convoy would have been rapidly in disorder had not its commandant, Belozerov, worked with a will, with voice and whip, and sparing none, rapidly restored order.

In the fighting on Angle Hill on the 21st and 22nd August he again distinguished himself. His 3rd Company lost 70 per cent. of its strength in repulsing the furious attacks of the Japanese, and he himself was always in the post of danger urging on his men. On the 22nd August, having been nominated commandant of that hill, in the place of the wounded Colonel Lisaevski, he personally several times led the reinforcements in counter-attack, repulsing an enemy ten times his strength, until he was wounded in the chest by a shrapnel bullet. Within little more than a month he was convalescent and again at the head of his company, then posted on Division Hill.

Generals Kondratenko, Irman, and Tretyakov, who had witnessed the fighting at Angle Hill, offered Belozerov the honourable post of joint-commandant of Visokaya Hill, which he willingly accepted.

At the beginning of the fighting the garrison of Visokaya consisted of the following:—

5th Regiment—2nd Company, 98 men.
4th Company, 103 men.
6th Company, 121 men.
14th Regiment—7th Company, 108 men.
15th Regiment—4th Company, 174 men.
Machine gun detachment (sailors).
Detachment of the Kwangtung Sapper Company.

One company was withdrawn for rest every two days. At the time of the fighting, the 7th Company, 14th Regiment, was resting.

The garrison of False Hill consisted of the following:—

5th Regiment—8th Company, 138 men.
11th Company, 148 men.

The commandant of False Hill, appointed in August, was Staff-Capt. Marchenko.

The garrison of Division Hill consisted of the following:—

5th Regiment—3rd Company, 137 men.
5th Company, 89 men.
7th Company, 182 men.
Portions of 2nd and 3rd Foot Volunteer Detachments, 93 men.
15th Regiment—5th Company, 96 men.
27th Regiment—9th Company, 133 men.

As commandant, Capt. Stempnevski II. was appointed in August.

The garrison of Flat Hill consisted of the following :—

5th Regiment—9th Company, 152 men.
10th Company, 152 men.
27th Regiment—4th Company, 108 men.
5th Company, 138 men.
8th Company, 118 men.
11th Company, 128 men.
Composite Company, 148 men.
Volunteer Detachment, 91 men.

From October the commandant of Flat Hill was Lieut.-Colonel Budyanski, 27th Regiment.

Intermediate Hill was occupied by 10th Company, 26th Regiment, more than 160 men, and its commander, Staff-Capt. Lax, was commandant.

The original position was occupied only during the fighting, and at other times was protected only by guards, who were posted in two places, on roads.

The following troops remained in reserve with the Staff of 5th Regiment, in the Artillery Barracks in Tea-House Ravine :—

5th Regiment, 12th Company, 112 men.

The 7th Company, 14th Regiment, were resting, and with the colours of 5th Regiment was 1 section, 11th Company, 22 men.

IV.—Causes which Obliged the Japanese to Persist in Attacking Visokaya Hill.

At the end of October the squadrons of Admirals Rozhdestvenski and Nobogatov were approaching Madagaskar, with a view to uniting and together moving into the waters of the Pacific.

This circumstance caused alarm among the Japanese, because the approaching Baltic squadrons, combined with the remaining uninjured ships of the Port Arthur and Vladivostok squadrons, would present a formidable strength. Therefore the Japanese Naval Administration urged the army besieging Port Arthur to take it without delay, or at any rate to seize positions from which they could destroy the fleet which was taking shelter there.

In November this urgency became so insistent that the army of General Nogi received a definite order to advance to the attack, in spite of the incompleteness of its preparations.

In addition to the three infantry divisions and the two detached infantry brigades which had hitherto been before Port Arthur, in October the 10th Brigade, composed of men of the 2nd call, arrived from Japan, and about the middle of November the 7th Infantry Division, which had as yet seen no service, began to disembark at Dalny.

An English correspondent, at that time with the Japanese before Port Arthur, writes of this division that it was composed of young fresh troops recruited in the Island of Hokkaido, and reputed the best and bravest of

the whole Japanese Army. Their arrival brought the strength of the besieging army up to close upon 100,000 men, including 24 infantry regiments.

With this force General Nogi again tried to take Port Arthur by assault, and on the 28th November, after several days' bombardment, the Japanese attack was carried out on the region of Forts Nos. 2 and 3.

Besides warning each soldier in this attack that he must be prepared to go to certain death for the attainment of the common object, the following is an example of the orders issued by the Japanese commanders:—

"Order of General Nakamura to a party of 2,000 volunteers who had engaged as a forlorn hope to work down the Lunho Valley:—

"The object of our detachment is to cut in two the Port Arthur defences. Not a man must hope to return alive. If I fall, Colonel Vatanabe will take my place; if he shares the same fate, the command will pass to Lieut.-Colonel Okuno. Every officer, whatever his rank, must appoint himself his successor. The fighting will be carried out chiefly with the bayonet. However murderous the enemy's fire, our men must not reply with a single shot until we are established in their lines. The officers are permitted to slay any men who, without cause, straggle, leave the ranks, or fall back." The story of the failure of this gallant party is well known and need not be repeated here.

In the course of 15 hours' continuous fighting the Japanese lost 10,000 men and failed to obtain the smallest success; not a trench was lost. From this they learnt that the hour had not yet come for the fall of these forts, and gave up hope in the early capture of Port Arthur.

On previous occasions, after their unsuccessful attacks, they had usually spent three or four weeks in preparation for a new attack; but in this case they were obliged to carry forward the attack without delay. The orders from Tokyo were peremptory, and Generals Fukushima and Kodama were sent by Marshal Oyama, the Commander-in-Chief of the Japanese Armies, to the headquarters of the besieging force to see that they were carried out.

And therefore, after giving up hope of the early fall of the fortress, General Nogi was obliged to push forward assaults with the object of capturing positions from which he could destroy the Russian fleet.

As Visokaya Hill was, if not the only, at any rate the most suitable position for carrying out this object, it forthwith attracted all the fire, the attention, energy, and the main forces of the Japanese.

V.—Fighting from 27th November to 7th December.

During this period the weather was settled, the days almost always bright and cool, with the wind blowing generally from the south-west, and the nights dark and cold (3° to 5° *Reaumer*).

On the 27th November the Japanese on the western front were largely reinforced, especially in front of the section commanded by Capt. Romanovski, where they pressed in the Russian mounted parties and tried to break through them, but were stopped by the timely arrival of reinforcements and the skilful and successful dispositions of Capt. Romanovski.

In the night of the 27th—28th November a Japanese force of not less than a battalion of infantry concentrated near Pigeon Bay, in front of a position held by Staff-Capt. Soloviev, with a composite company of the 11th and 12th Regiments (collected from the depôt of these regiments, which was in Port Arthur) and the foot volunteer party of the 28th Regiment, under Lieut. Mikheev, in all about 300 men, and forthwith attacked it.

It should be mentioned that the repulse of the September attacks was greatly assisted by the action of a section of field artillery under Staff-Capt. Yasenski, which moved out from the direction of Pigeon Bay and, by its unexpected and well-aimed fire, dispersed about a brigade of reserves at the foot of Visokaya Hill. To prevent this occurring again, the Japanese hoped to take the position at Pigeon Bay before again attacking Visokaya.

After a desperate struggle, the Japanese, at about 3 a.m. on the morning of the 28th, succeeded in breaking through and capturing the most forward knoll; but the attack on the main position was repulsed with grenades and rifle fire. The artillery from Lieut. Erofeev's position assisted in obtaining this result.

In the hope of driving the Japanese from the front knoll, Staff-Capt. Soloviev at dawn carried out a counter-attack, in which he was killed; but the knoll remained in the hands of the Japanese.

(*To be continued*).

NOTICES OF MAGAZINES.

MITTEILUNGEN ÜBER GEGENSTÄNDE DES ARTILLERIE-UND GENIEWESENS.

DIRIGIBLE BALLOONS AND AEROPLANES.—In view of the recent aviation week held at Rheims, the following notice, in the May number of this journal, on the military uses of dirigible balloons and aeroplanes, is of interest. The article divides airships into two classes :—

(1). Those lighter than air.
(2). Those heavier than air.

The first class—dirigible balloons—provide a large and prominent target for the artillery, have a mean velocity of 50 kilometres per hour (which is much less when they are travelling against the wind), and thus remain from 3 to 10 minutes within effective range of the guns. In this time an 8-gun battery can fire 800 shots, and a company of infantry about 30 volleys. A single well-directed volley or direct hit from a shell is sufficient to bring the balloon to the ground. Dirigible balloons also need costly sheds and workshops at fixed points on the line of march. Landing, even in a light wind, is no easy operation with a large balloon, and when accomplished, the balloon has to be instantly emptied, unless there is an appropriate shed to house it in. Whereas dirigible balloons seem to have attained the highest degree of perfection, aeroplanes have still vast possibilities open to them. The maximum velocity hitherto attained is 30 kilometres per hour,* but there is no reason to believe that this will remain the limit of speed ; in fact, in view of the progress made in recent years, the statement that an aeroplane bears the same relation to a dirigible balloon as a motor car to a traction engine seems by no means an exaggeration. Thus, from a military point of view, aeroplanes are preferable to dirigible balloons for the following reasons :—

(*a*). Aeroplanes have already a greater velocity than dirigibles, and appear likely to attain still greater speed.
(*b*). They can reasonably be expected to fly at greater heights than balloons, although at present such is not the case.
(*c*). They provide a far smaller target.
(*d*). In an aeroplane, only the motor and crew (one or two men) are really vulnerable, for small injuries to the planes do not affect the flight. In balloons, on the other hand, every shot which hits the gas-bag involves a loss in lifting power, and any kindling of the gases means destruction.

* At Rheims a speed of 74·318 kilometres was attained by M. Blériot.

(*e*). The cost of aeroplanes is much less than that of dirigibles, especially if the necessity of sheds and workshops for the latter are taken into account.

(*f*). An aeroplane can rise from any free space without external assistance, whereas—especially in windy weather—a whole army of men is required to hold down a balloon.

(*g*). An aeroplane is light, and can be easily transported.

As regards the strategical uses of aeroplanes, their first object will be to reconnoitre the country in front of the army, with a view to discovering the points of concentration of the enemy. This reconnaissance, which is entirely different from that of the cavalry, will extend as far as 100 kilometres from the army, and must be carried out in one day. It will need two persons, one for the tactical work and the other for driving the aeroplane. Arrangements must also be made to automatically photograph the ground passed over. Each aeroplane can reconnoitre a strip of land 30 kilometres broad.

Tactically, aeroplanes will be used to find out the enemy's flanks, the position of his reserves and concealed batteries; to assist the artillery by observing their fire; and to carry messages either to other forces or to besieged towns. In fortress warfare they can be used at night to explore ground lit up by searchlights, their extreme speed making it easy for them to avoid discovery by the hostile lights.

As regards the offensive, aeroplanes are as yet powerless, the main difficulties being that explosives cannot be dropped from them with any accuracy, and that the weight of the charges required to really damage heavily armoured forts is greater than an aeroplane can carry.

THE RESULTS OF AERIAL NAVIGATION.—On the 23rd December, 1908, Major-General Kowanjko, commandant of the Russian airship park, gave a lecture at St. Petersburg on the results hitherto attained in aerial navigation and their application to military purposes. The three questions to be answered with regard to the latter part of the subject were:—

(*a*). Which of the existing flying machines has given the most satisfactory results?

(*b*). How must aerial navigation be organized, and what are its objects?

(*c*). What measures must the State take not to remain behind other countries in this new means of travelling?

To these the General added a fourth question: "What is required of an airship to make it suitable for war purposes?"

Military airships can be divided into five classes:—

(1). Fortress airships.
(2). Field airships.
(3). Siege airships.
(4). Coast airships.
(5). Airships for landing troops.

These five classes can further be placed into categories :—

(1). Airships for the attack, *i.e.*, provided with explosives.
(2). Reconnoitring or signal balloons.

The fortress airship for purposes of reconnaissance must be able to rise to a height of at least 2,000 metres, and remain at least three hours at that altitude. Its speed must be from 54 to 65 kilometres per hour, and the time it can remain in the air 12 hours, needing a capacity of 8,000 cubic metres. Sheds and workshops must exist in its sphere of activity, and the meteorological conditions of the locality must be well known. The fortress balloon for offensive purposes must be able to carry explosives in large quantities for the destruction of objects beyond the range of the guns of the fortress. Field balloons are primarily required for reconnaissance, and must also be easily transportable. The non-rigid (*nicht starre*) balloons are especially suitable for this purpose. Siege balloons are similar in their requirements to fortress balloons, but must be more mobile. Coast balloons are balloons for attacking ships, destroying mine-fields, and preventing blockades; their *rôle* is an offensive one.

Landing balloons—a German invention—would be balloons about five times as big as the Zeppelin airship, and capable of carrying 100 to 300 men. It is interesting to note that, size for size, their cost is $\frac{1}{15}$ of that of a modern warship.

Flying machines of the heavier-than-air type can be divided into three classes:—

(*a*). Ortopters—which imitate the flight of birds.
(*b*). Heliopters—propelled by a screw.
(*c*). Aeroplanes—with fixed planes—which are propelled by means of motor-driven screws.

The construction of aeroplanes is making such rapid progress that it would be unwise for any army to disregard this new factor in the art of war, and, moreover, the training of a certain number of expert aviators is made essential, as "driving" an aeroplane is an art which it takes much practice to acquire.

GERMANY.—To encourage firms to manufacture heavy tractors of 30-H.P. and more, suitable for military purposes, the German Government has voted 1,000,000 marks to be spent in subsidizing firms who make use of such tractors. They are not to be sold to foreigners.—The number of infantry machine-gun detachments has been increased from 17 to 50. A machine-gun detachment is commanded by a subaltern, and consists of three sections of two guns, each section being commanded by a lieutenant. Thus each battalion has two guns at its disposal, as opposed to four mitrailleuses per three battalions, as in the French Army.—Practice against captive balloons is to be carried out again this year in the Gulf of Dantzig. Guns on special mountings will be used, as the past year's practice with howitzers was unsatisfactory. An anti-balloon gun must command all altitudes from which a balloon can make observations or throw explosives.

FRANCE.—According to the *Revue de l'Armée Belge*, the firm Creusot has placed before the French War Office a shield of nickel steel, 3·8 millimetres thick, 30 millimetres high, and 35 centimetres broad, whose weight is 3·3 kilogrammes. The increase in weight involved by carrying this shield would, in the case of the infantry, be counterbalanced by not carrying a second pair of shoes and certain articles of clothing not absolutely essential, and also by the use of a lighter type of haversack. The price of such a shield is 7 francs 20 cents.

A. H. SCOTT.

REVUE MILITAIRE DES ARMÉES ÉTRANGÈRES.

May, 1909.

A TERRITORIAL FORCE (MONTENEGRO).—Since the proclamation of the constitution in 1906, a methodical system of organization and administration for the army has been thought out, and the results are incorporated in the Recruiting Act of 1908. The Montenegrin Army, like the Swiss, remains, as before, a national militia force, but now possesses a legislative basis.

Every Montenegrin between the ages of 17 and 60 must serve as follows:—

Recruits' Classes (18 to 19 years of age), which consist of two trainings, each lasting four weeks.
Regular Army (1st class), 20 to 44.
Regular Army (2nd class), 45 to 50.
Reserve, 51 to 60.

The regulars have each year to attend manœuvres (15 days) and also the occasional parades ordered by the O.C.'s of their company, battalion, brigade, and division.

The men who desire to qualify for the rank of N.C.O.'s are chosen by their battalion commanders from soldiers of not less than three years' service, and undergo a month's course, have charge of a squad of recruits for eight weeks, and then attain, at about the age of 23, the rank of *desetchar* (commander of ten, or lance-corporal). The same routine is followed to obtain the rank of corporal, which is reached when 27 to 28 years old. At about 31 years of age the corporal can become a second lieutenant, after a five months' course; at 34, he can become a lieutenant; at 38, a captain; at 44, a major; at 52, a major-general; and at 62, a general. The ranks of colonel and lieutenant-colonel are unknown.

Promotion examinations, both theoretical and practical, have to be passed for promotion to all ranks up to major. Besides the Regular Army, there exists the "Special Service," composed of officers *de carrière*. They are chosen from boys who have either had a secondary education, or have undergone a course in some military college in Montenegro

or abroad. In the latter case the candidates have to pass an examination in the organization of the Montenegrin Army. The rates of promotion are as in the Regular Army, but the first commission is obtained at the earlier age of 22. After three years' service, officers have to pass an examination similar to that for Staff College; if they fail twice, they keep their rank in the Regular Army, but leave the "Special Service"; if they pass, they are sent to study in some foreign Staff College.

Officers of the "Special Service" get 30 days leave per annum, exclusive of short leaves of 3 days.

AUSTRIA.—Successful trials have been made with 100-H.P. 6-cylinder Daimler motor cars, to drag 24-cm. siege howitzers. The speed attained was 15 kilometres per hour and the car can drag the howitzer across fairly rough ground.

GERMANY. — The War Office at present possesses the following airships:—

Three Gross (half-rigid system).
Parseval No. 2 (non-rigid system).
Zeppelin No. 1 (rigid system).

These are to be distributed as follows:—

A dirigible of either system will be stationed at both Metz and Cologne. This will be possible in three or four months, when Parseval No. 3 and Zeppelins Nos. 2 and 3 have been bought.

Zeppelin No. 1 remains at Friederichshafen, and is to be used for instructional purposes by the "Luftschiffee Batallion."

A new shed is being built near Griesheim by the pioneers of the VIIIth Corps, garrisoned at Maintz.

In the June number of the *Revue* it is stated that as the result of several trials the War Office has decided to place a certain number of search-lights on motor cars, and, it is believed, to make use of them in the coming manœuvres. The present model has an illuminating power of 25,000-C.P., and is driven by a 10-H.P. engine.

ITALY.—120 machine guns have been issued by the War Office for use by the infantry, cavalry, and Alpine troops of the Ist, IInd, and IIIrd Corps.

June, 1909.

THE TURKISH ARMY IN 1909.—The revolution on the 23rd July, 1908, has not only already brought about great changes in the organization of the Ottoman Army, but has led to other changes also being considered. It is proposed therefore to give the following details of the army as it actually is at present, so that any new transformations may be more readily understood.

(1). *High Commands and Central Administration.*—The Sultan is still the head of the military forces, but now exercises his power through the War Minister, and not personally as heretofore.

The central administration originally consisted of the War Minister and the Grand Master of Ordnance. Since the end of 1908 the Grand

Master of Ordnance is placed under the War Minister and has the title of *nazir* (grand director).

(2). *Population, Strength of the Army, and Recruiting Laws.*—The Ottoman Empire has a population of 24,000,000 souls. Several of these are either Christians, Albanians, inhabitants of Constantinople, Arabs, or Anatolians, and as such are exempt from military service. 11,000,000 to 13,000,000 Mussulmans are left, who have to provide an army with a peace strength of 267,000 men. Certain classes, *e.g.*, persons holding functions in the Sultan's court, educated youths, and theological students, are further exempted, but steps are being taken to revoke the exemption of theologians, as in many villages the inhabitants study theology to avoid military service. Attempts are also being made to raise extra troops by the formation of Albanian, Christian, and other irregular battalions, but have as yet met with little success.

In 1908 the strength of the army was reduced from 386 to 357 battalions.

The duration of service is three years, but may be prolonged should the national political situation demand it.

The population has to serve as under:—

Class A.—Men who serve three years in the standing army:—
- Between 21 and 23 in the Nizam (Regular Army).
- Between 24 and 29 in the Ikhiat (Class A Reserve).
- Between 30 and 38 in the 1st Class Redif (or Reserve).
- Between 39 and 40 in the Mustafiz or Territorial Militia, which has no permanent organization.

Class B.—Exempted men:—
- Between 21 and 38 in the 2nd Class Redif (Reserve), *i.e.*, six to nine months' actual service.
- Between 39 and 40 in the Mustafiz.

The men of the Redif are called out for a month's training every two years, but may be kept six months should the political situation demand their retention.

(3). *The Officers.*—The officers are drawn from two sources:—

(*a*). Mektebli, from military schools.
(*b*). Alaili, from the non-commissioned ranks.

The latter only undergo practical promotion examinations, and consequently are often very illiterate.

The Mektebli are educated:—

(*a*). For four years in one of 32 elementary schools under military direction.
(*b*). In military colleges, like the German Kadetten Schule, on leaving which they enter either:—
- (1). The Imperial School of Military Sciences at Pancaldi (Constantinople) for cavalry or infantry—a two years' course, or
- (2). The Military School for Artillery and Engineers at Constantinople for a three years' course.

The top competitors on passing out receive a further three years' course, and join the general staff, or the headquarter staffs of the artillery or engineers.

The candidates are all chosen young, brought up in a very modern way by European professors, and thus form a body of officers ready to carry out new ideas. There is practically no supply of reserve officers.

The N.C.O.'s are often professionally good men, but are extremely illiterate.

4. *Organization.*—Turkey is divided into seven military districts (*Ordous* or *Army Corps*) and two independent divisions (Tripoli and Hedjaz).

1 ordou = 2 to 4 regular (nizam) divisions, 1 cavalry division, and an artillery division of as many brigades as there are infantry divisions.

Six of these districts are subdivided into four redif (reserve) districts. These reserve troops, being composed of peasants used to handling arms, may be taken as of equal value as the nizam troops. Three of the ordous are in Europe, at Constantinople, Adrianople, and Salonika, the remaining four in Asia Minor. The redif divisions have no artillery.

5. *Engineers.*—The engineers are made up of—

(*a*). Fortress troops in Europe = 3 battalions pioneers, 1 battalion miners; and in Asia, 2 pioneer companies at Damascus and Baghdad.

(*b*). Field troops—1 battalion to each of the first four ordous. Each battalion = 3 pioneer companies, 1 company miners, 1 telegraph company. Also 1 company to the Hedjaz division and 1 battalion (4 companies) to the Tripoli division.

(*c*). 3 railway battalions.

(*d*). The bridging material at Constantinople = 15 trains of 2 trestles and 6 pontoons each.

(*e*). In war time 11 4-company redif battalions are organized.

6. *Foot Artillery* of 154 companies.

7. *Transport and Supply* troops, consisting of 7 battalions of 3 companies each.

8. *Gendarmerie.*—Composed of 33 regiments of 3 to 6 battalions, each battalion being made up of 4 companies and 1 squadron. Total, 100,000 men and 18,000 horses. The gendarmerie is to be reorganized, and the foreign officers allotted as follows:—French to Macedonia; English to Syria; Italians to Anatolia.

9. *Armaments.*—The infantry are armed with 1890 Mausers, calibre 7·65 millimetres. In the artillery the 75-millimetre Q.F. Krupp gun is going to supersede the 87-millimetre Krupp on a non-recoiling mounting.

The strength of the field artillery is:—

30 regiments = 60 battalions	= 180	batteries.
9 battalions mountain artillery	= 27	,,
6 battalions horse artillery (78·5 Krupp) ...	= 18	,,
2 howitzer regiments (12-cm. Krupp) ...	= 12	,,
The artillery of the VIth and VIIth Ordous and the Tripoli division	= 34	,,
Total	271	batteries.

The cavalry is armed with a sword and the 7·65 Mauser carbine.

10. *Actual State of the Army.*—Since the revolution the army has presented a scene of busy activity. A new infantry training manual, like that of the German Army, has been published, long distance rides have been undertaken by the cavalry, and the artillery have at last carried out practice with live shell. Manœuvres have been carried out, mainly under the direction of junior officers, who have undergone courses in foreign schools. Finally, a daily military paper, *Asker*, has been founded.

A. H. SCOTT.

RIVISTA DI ARTIGLIERIA E GENIO.

May, 1909.

AUTOMOBILES OF VARIOUS COUNTRIES.—In the organization of armies no invention can be overlooked. Not only should industrial inventions be accepted, but others should be sought for. Much has been done by the science of metallurgy which is especially due to the requirements of the fleets and of modern armies, which are its most important clients. Setting aside the moral factor—always of the greatest importance—it may be retained as a maxim that the nation which will be best adapted for sustaining a war will be that one in which the military institutions have been kept on a level with the latest industrial successes.

One of the more recent of these successes is the automobile, which after a certain period of trial is now largely employed in several armies, and is capable of rendering immense service in a campaign.

It may perhaps not be out of place to give a short account of what has been done by other nations, as well as Italy, towards applying automobilism for military use; and by doing so we may be able to regulate the production of automobiles, and to organize our automobile services in a manner that will enable us to confront any eventualities.

Belgium.—Although provided with good roads, automobile manufactories, and enthusiastic automobilists, Belgium has not made great advance in military automobilism. It is however forming an automobile *personnel* for reconnaissance and inspections, and experiments are being carried out with automobile wagons for the transport of stores and ammunition. The Government of the Congo has constructed at Brussels an automobile of 30-H.P., to carry a weight of 1,000 to 1,500 kilogrammes, with a velocity of 15 to 20 kilometres per hour. Wood or petrol is used. This vehicle would do the work of 400 p orters.

Bulgaria.—The War Office has organized a section of troops of communication, and has sent a Commission to Vienna to examine the organization of the automobile service of the Austro-Hungarian army. This Commission has visited several automobile factories and has assisted at several experiments.

Denmark.—The proposals of Dr. Westenholz have been adopted for the creation of a corps of automobile volunteers. He has placed at the disposal of the State 3 automobiles, 80 motor cycles, and 80 automatic rifles, with 3,000 cartridges per rifle. Each motor cyclist will carry

an automatic rifle and a first instalment of 800 cartridges; the remainder of the ammunition will be carried in the automobiles. The corps will be organized, and will receive military instruction under the command of a captain. The volunteers will perform 14 days' service each year, during the period of the manœuvres.

France.—No corps of automobile volunteers has yet been formed in France, but there are groups of automobilists organized on a military basis. At Paris there is the *Société militaire d'automobilistes*, which proposes to give to its members a sufficient military instruction, with a view to their becoming not only good individual chaffeurs, but also good leaders of automobile convoys. In the Paris district there is also the *Association amicale des automobiles militaires*, which has for its scope the grouping of automobile volunteers, and of proposing to the military authorities conductors who may be useful under all conditions, will be well clothed, and imbued with a sense of responsibility in event of mobilization. The military journals in France insist on the need of a real corps of volunteer automobilists.

At the end of 1897 the Minister of War instituted a Commission of officers to enquire into and study the uses of the automobile for military service. This Commission has up to the present followed all the trials made with the automobiles. In 1900 the War Minister, owing to the favourable reports furnished by the Commission, acquired two trains—Scott—which were placed on service between Versailles and Vincennes for the transport of artillery; one Panhard-Levassor and one Peugeot automobile were also acquired for the transport of *personnel*.

At the great manœuvres of 1900 service automobiles were employed for the first time. The trials gave good results, so that the employment of automobiles at the great manœuvres became the subject of special regulations.

At the manœuvres in 1901 light wagons and autocars were used in great numbers, and in 1903 the Renard train made its appearance.

At the siege exercises at Langres in 1906 10 automobile wagons were used for carrying water from a distance of 40 kilometres.

The trials at the great manœuvres of 1907 were of great importance. In those which took place in the south-east of France 40 automobiles (supplied by the French Automobile Club) were used for victualling the 18th Army Corps. Bordeaux was selected as a victualling centre, and the cars had to traverse from 100 to 140 kilometres daily to supply the regiments.

At the manœuvres of the 7th Army Corps at Besançon the victualling was supplied by an automobile car of 75-H.P. and three wagons in tow. The length of the train was 225 metres and had a working capacity of 10 tons. These trains made daily journeys of about 90 kilometres, the greatest being 130 kilometres. They transported altogether about 9,000 tons of stores. This experience shows that road trains can be used with great advantage on a campaign.

At the great manœuvres in 1908 between Tours and Bourges the provisions for the troops were transported entirely by automobiles. Endeavours were made to arrive at a truly practical type of vehicle,

the ideal being a unique type in which all the cars were identical in construction.

The average velocity should be 12 kilometres for the automobile cars (or autocars) and 9 kilometres for the trains.

A complete set of regulations for the census and for the requisitioning of the automobiles has been approved by the House of Deputies. The War Minister has notified that from 1910 on, he will ask from Parliament an important sum of money, to be assigned as prizes for the automobiles best adapted for war service. Under the date of the 18th March, 1908, the *Bulletin Officiel* published "Provisional Instruction for the Employment of Automobiles in the Army," a notice of which was given in this Review (in 1908, Vol. II., p. 293).

Italy.—Italy, which possesses relatively few horses, has greater opportunities than many other nations of employing automobiles as a means of transport for the army. Since the end of 1873, road locomotives have been used both in the army and for industrial purposes. In successive years a certain number of road locomotives were acquired (in England) for military purposes, and were usefully employed on the construction of fortifications and on the transport of stores. These locomotives were rather slow—5 kilometres in the hour—but strong, and were used in building the arsenal at Spezia, and for the armament of all the fortifications of this military post. In late years the road locomotives have been abandoned and automobiles with benzine have taken their places.

In the summer of 1904, an experiment was made with 29 carriages which, setting out from Brescia, were charged with the duty of making journeys of 200 kilometres in 2.4 hours. A similar trial was carried out in the winter season in February, 1905. These trials, made under different conditions of temperature and strain, resulted in the acquisition of the normal type of automobiles used by the army in the following years.

At the manœuvres at Novara, in 1905, and 1907, and Liguria, in 1907, the cars were used for the transport of the officers and the wagons for transport of stores and provisions.

By a ministerial decree of 18th July, 1906, an automobile section of the railway brigade was formed, and the training of officers of the several arms in courses of automobilism was entrusted to it.

EDWARD T. THACKERAY.

RECENT PUBLICATIONS OF MILITARY INTEREST.

JULY, 1909.

(*Published Quarterly*).

THE following extracts from the list compiled by the General Staff, War Office, are published in the *R.E. Journal* by permission of the Army Council.

o o o o o

PART II.

SECTION I.

HISTORICAL.

THE BRITISH EMPIRE, ITS PAST, ITS PRESENT, AND ITS FUTURE. Edited by A. F. Pollard, M.A. 864 pp. 8vo. London, 1909. The League of the Empire. Caxton Hall. 5s.

This exhaustive account of the British Empire owes its origin to the generosity of Mr. Louis Spitzel and the enthusiasm of Mr. Thomas Henry Monk, though, unfortunately, neither lived to see the result of their practical interest in the Empire. The work made possible by their efforts however was entrusted to the History Section of the League of the Empire, with Professor Bury as its chairman. The object of the volume is primarily educational, and the secondary object is to make further provision for education in the Empire.

The work is divided into three sections (or books), and begins with a description of the physical features of the British Isles and a brief outline of English History from the year B.C. 55 up to the present time. It also deals with the founding of the British Colonies, commercial expansion, and other political and social problems. About one-third of the contents of the book is the result of the co-operation of men actually responsible for the government of the Empire in all quarters of the globe.

Book 2 deals with the self-governing States; their expansion, politics, natural resources, trade, etc.

Book 3 treats of the Empire of India, Crown Colonies, and Dependencies.

Accounts of the wars in Canada, the American War of Independence, New Zealand wars, the several conflicts in South Africa, including the war 1899—1902, and wars in India are included in this volume, together with the events leading up to them and the results which followed.

The chapter on "Downing Street and the Colonies" (XVI.) and the concluding chapter on "The Future Organization of the Empire" are of interest to all students of the Imperial problem.

THE CHANCELLORSVILLE CAMPAIGN. By Charles Richardson. 124 pp. 8vo. New York and Washington, 1907. The Neale Publishing Company. 4s.

The author, who is a Southerner, confines himself, as the title page "Fredericksburg to Salem Church" indicates, to an account of the part played by Sedgwick in the above campaign. The sketch which he gives of the Federal general's operations is very slight. It takes the shape of a narrative without criticism or comment, maps or plans, set forth in somewhat high-flown language, and consequently fails to throw any light upon the controversies which have arisen in regard to the conduct both of Sedgwick and Early.

GERMAN OFFICIAL ACCOUNT OF THE RUSSO-JAPANESE WAR (WA-FAN-GOU). Authorized translation by K. von Donat. 256 pp., with 4 appendices, including 5 photographs; 11 maps in pocket. 8vo. London, 1908. Hugh Rees. 10s. 6d. (For Yalu volume see p. 14 of No. 8).

This is a continuation of the history prepared by the German Great General Staff. The first portion dealt with Port Arthur, and of this no translation has yet been published. The second was an account of the events leading up to the war, and the operations by land and sea up to the Ya-lu inclusive. The present volume is the third instalment, and deals with the operations after the Ya-lu and up to the evening of the 28th August, 1904, immediately preceding the Battle of Liao-yang.

The work has the same defects as the translation of the second instalment, in that the names are spelt according to the German method, so that it is only by comparing dates that some of the places can be identified, and the English is at times a little hard to understand. The details are however worked out in a most painstaking manner, and the book contains a quantity of useful information.

It is divided into six chapters, of which the first opens with a description of the situation in the south-western theatre towards the end of May, 1904. The Battle of Nan-shan was described in the first part of the history, and only the briefest of references is here made to it; the earliest general action considered is that of the 2nd Japanese Army at Tê-li-ssŭ (Wa-fang-kou). The second chapter is a continuation of the first, and deals with the operations subsequent to Tê-li-ssŭ up to the beginning of August, 1904. General Kuropatkin is described as nervous lest his "southern detachment" at Kai-p'ing might be cut off, and as having lost heart after the reverse of Tê-li-ssŭ. The chapter includes an account of the Battle of Ta-shih-ch'iao and of the arrival of the 4th Japanese Army, which came into position on the right of the second, ending with the occupation of Hai-ch'êng by the Japanese.

In Chapter III. the scene is shifted to the eastern theatre, and the operations are described from the time the 1st Japanese Army left Fêng-huang-ch'êng until the beginning of August, 1904. It is stated that Kuropatkin, being anxious about his left flank, sent the 10th Army Corps to check any movement in that direction, and that this corps sacrificed its initiative for the sake of having an entrenched position on to which it could fall back.

Chapter IV. contains a survey of the situation immediately before the operations leading up to the Battle of Liao-yang. On the whole it is disappointing, but some interesting examples are given of the Russian ignorance as to the forces to which they were opposed. The total strength of the Japanese in Manchuria at this time, *i.e.*, the 1st, 2nd, and 4th Armies, is placed at 125,000, while the number of Russians opposed to them is estimated at 185,000, of whom perhaps 140,000 were combatants. The Russians, moreover, received reinforcements during the fighting, whereas the Japanese grew steadily weaker owing to their heavy losses.

Chapter V. describes the operations resulting from the advance of the 1st Japanese Army on Liao-yang, and the fighting of the 26th to 28th August, while Chapter VI. deals with the 2nd and 4th Armies for the corresponding period, and closes with a general review of the situation on the evening of the 28th August, 1904.

The most interesting portion of the book is the chapter of comments with which it concludes. Although consisting of barely 10 pages, it is full of trenchant criticism from

beginning to end. Attention is drawn to the peculiar effect which the geographical features of the country had upon the Russian strategy, by neutralizing to a large extent the advantage which they possessed in acting on interior lines, but adverse comment is made on the lack of decision and initiative displayed by the Russian commanders, and on their habit of relying on entrenched positions. The slowness of the Japanese advance is attributed to the necessity for making sure of everything which they gained, and of guaranteeing themselves against any reverse, however slight, lest difficulties should arise when they required their next foreign loan.

The Appendices show the organization of the forces on both sides.

THE RUSSIAN ARMY AND THE JAPANESE WAR. By General Kuropatkin. Translated by Capt. A. B. Lindsay, 2nd Gurkha Rifles, and edited by Major E. D. Swinton, D.S.O., R.E. In two volumes, with maps, illustrations, and index. Vol. I., 309 pp.; Vol. II., 335 pp. 8vo. London 1909. Murray. 28s.

The original work consisted of four volumes, the first three of which dealt with the fighting round Liao-yang, on the Sha Ho, and at Mukden.

Capt. Lindsay's translation embraces only the fourth and a small portion of the third volumes.

General Kuropatkin commenced his book in Manchuria while superintending the demobilization of the Russian forces after the war, and completed it at his country seat in Russia. Its publication in Russia was immediately stopped.

The work at present under review, being well translated and carefully edited, forms a readable and instructive publication, providing much food for thought, as well as useful information for the student of Russian military organization.

As the translator aptly remarks in his preface, it is no mere *apologia*, but a protest that the war, as far as Russia was concerned, was not fought to a finish.

The following is a brief summary of the contents :—

Volume I. Author's introduction.—Sources from which the material for the first three volumes were drawn. Baneful influence of the Press. The work done by the Ministry of War during the period 1898—1904.

Chapter I.—The problems with which the Russian War Department was confronted during the past two centuries. Russia's struggle to reach the Baltic and Black Seas. The problems of Poland and Finland. Causes of the failure in the Crimea, 1854-55. Defective organization exposed by the Russo-Turkish War, 1877-78.

Chapter II.—The strategical suitability of Russia's European and Asiatic frontiers. Possible results of a war with Germany or Austria.

No advantage to be gained by territorial acquisition in Persia. The possession of India would be an insupportable burden for Russia. Necessity for strengthening Russia's western frontier in preference to aggressive enterprise elsewhere.

Chapter III.—The expansion of the Russian Army in the 18th and 19th centuries. The growth of neighbouring armies. Russia's isolation in 1878. Afghanistan a hostile buffer State. The inferiority of Russian strategic railways. The magnitude of the problem of the defence of the Russian Empire.

Chapter IV.—Russia's military policy in the 20th century. No need to increase her territory. Great danger on the western frontier, owing to the perfect state of German and Austrian preparations. Russia, being essentially a land Power, ought not to spend large sums on a navy.

Chapter V.—The task which confronted the War Minister previous to 1904. Inadequacy of the sums voted for improving the army.

The strengthening of Russia's position in the Far East. Vladivostok and Port Arthur. The Siberian Railway. New Q.F. field guns.

Chapter VI.—Kuropatkin's efforts, as War Minister, to avert hostilities with Japan. Bezobrazov and the Royal Timber Company.

Chapter VII.—Causes of the success of the Japanese. Their patriotism and high *moral*. Low estimate of their strength formed by the Russian staff.

Chapter VIII.—Reasons for the failure of the Russians. Insignificant part played by the fleet. Inadequate carrying capacity of the Siberian Railway. Delay in mobilizing reinforcements. Anxiety for her western frontier and internal disorders prevented Russia from sending her best troops to the Far East. The long railway journey was detrimental to efficiency and discipline. Lack of military spirit among the older reservists. Depletion of the combatant ranks. Shortage of officers. Defective technical equipment. Premature declaration of peace.

Volume II. Chapters IX. and X.—Reasons for Russian failure (continued) :—

Want of uniformity in training of troops, especially in the Kiev Military District, under General Dragomirov. Faulty staff work. Neglect of intercommunication. Insufficient cavalry reconnaissance. Lack of co-operation. Employment of dense formations in the attack. Waste of ammunition. Neglect of the spade. The series of instructions issued to the troops by Kuropatkin during 1904 are given. They are full of elementary platitudes, and contain frequent allusions to bad leading on the part of officers and skulking on the part of the rank and file. Ignorance and general inefficiency of the reservists. Strategical error in not concentrating at Harbin until the arrival of reinforcements. Evil influence of seditious propaganda among the troops. The Russian troops were unfamiliar with mountain warfare. Units were below strength owing to the large number of men employed on non-combatant duties, and various pretexts found for quitting the ranks. Drafts arrived too late.

Strained relations between the Commander-in-Chief and corps commanders. Disregard and wilful contravention of orders. General Grippenberg specially censured in this respect.

The defects of the officers are enumerated. Higher commanders showed lack of initiative and ignorance of tactics. Regimental officers unable to read maps. Regular officers were, as a rule, brave but ignorant. Ensigns of the reserve proved very unsatisfactory and lacked military instinct. Those promoted from the ranks for distinguished service were excellent.

General staff officers did good work, but were not sufficiently in touch with the troops.

As regards the rank and file, those serving with the colours were thoroughly reliable, but many of the reservists, especially second category men from large towns, were difficult to handle.

The war was unpopular. Lamentable indifference of the civil population. Thousands of idle students unwilling to enlist. Hostility of the social revolutionaries.

Kuropatkin's farewell address to the officers of the 1st Manchurian Army is given at length.

Chapter XI.—Measures suggested for improving the army.

The principal reforms advocated are* :—

(1). The amelioration of the material position of the officers.
(2). Inducements to N.C.O.'s to extend their service.
(3). Means for keeping reservists in touch with the army.
(4). Relieving the private soldier from non-military duties.
(5). Increasing the proportion of sappers in a division.
(6). Reducing the proportion of guns to rifles in a division to 3 per 1,000.
(7). The formation of depôt battalions for each regiment on mobilization.

As regards higher organization, the author advocates having three infantry divisions in an army corps, each division consisting of two infantry brigades, a regiment of artillery (four batteries of 12 guns each), a sapper battalion, a telegraph company, and two squadrons of cavalry, besides transport company, parks, hospitals, bakeries, etc.

For the composition of a cavalry division he recommends three cavalry brigades and a horse artillery battery of 12 guns. Two batteries of howitzers (12 howitzers to each battery) should be allotted to each army corps as corps artillery.

The failure of the cavalry in the war was due to bad leading. The junior officers were, as a rule, good, the field officers moderate, and the generals, with few exceptions, bad.

* Most of the suggestions have since been adopted.—*General Staff, W.O.*

Chapter XII.—Recapitulation of the causes of the failure of the Russians. Improvements made during the war to the Siberian Railway. Carrying capacity raised from 2 to 12 pairs of military trains in 24 hours. The Russian Army had reached a strength of 1,000,000 men when peace was declared, while the Japanese were then at the end of their resources.

Chapter XIII.—Introduction and conclusion to Volume III. A recapitulation. Difference of opinion between Kuropatkin and Viceroy Alexeev as to the strength of the garrison required for Port Arthur.

Disposition of the Russian troops in the Far East in March, 1904. Premature engagement with the enemy by General Zasulich on the Ya-lu in direct contravention of Kuropatkin's orders. Zasulich's excuse that he thought he could defeat the enemy. Kuropatkin advocated concentration of forces in Manchuria, and discouraged the relief of Port Arthur.

Account of the fighting at Liao-yang and on the Sha Ho. Mishchenko's raid on Ying-k'ou. Battle of Mukden. Causes of the Russian defeat. Kuropatkin blames himself.

Appendices.—I. The Royal Timber Company. II. The breakdown of the Russian unit organization and system of distribution.

NAPOLEON'S STAFF OFFICERS (Les états-majors de Napoléon). By General Derrécagaix. 650 pp., with 8 maps and plans. 8vo. Paris, 1906. Chapelot. 10s.

The author points out that, after the successive victories of Napoleon, the names of his great generals became household words, and all the successes were rightly attributed to them. Many of the triumphs however could not have been gained without such men as Berthier, Andréossy, Belliard, etc.

Belliard, Murat's chief of staff, was *par excellence* a cavalry staff officer, and possessed many of the qualities in which Murat was deficient.

As staff officer of cavalry, Belliard's record of campaigns comprises the wars of the Republic, campaign in Italy, the Tyrol, Egypt, Austerlitz, Prussia, Poland, Spain, Russia, Saxony, and the war of 1814. It was only in 1815, when Murat was no longer available, that the Emperor gave him command of a corps.

NAPOLEON'S MARSHALS. By R. P. Dunn-Pattison. 358 pp., with index. 8vo. London, 1909. Methuen. 12s. 6d.

The careers of the 26 marshals of the First Empire contained in this volume are of more interest as a study of their characters and of the character of the Emperor than from a historical point of view. The events in which they took part are but briefly outlined in so far as they affect the subject of the biography. The character sketches are well drawn and are interesting. Portraits of 19 of the marshals add to the attraction of the book.

THE RUSSIAN CONQUEST OF THE CAUCASUS. By John F. Baddeley. 518 pp., with 5 maps, 2 plans, and illustrations. London, 1908. Longmans, Green. 21s.

The Caucasus may be described as a mountain chain 650 miles long by about 100 miles broad. In the west, a forest region stretching down to the Black Sea, the Cherkess tribes waged desultory war against Russia from the end of the 18th century till 1864. In the east the inhabitants of the forests of Chechnia and of the mountain plateaus of Daghestan defended their country nearly as long and with a larger measure of temporary success. In the centre the local tribes never gave serious trouble, and so the Georgian road, the only line by which the Russians could move south to the help of their Georgian allies beyond the great range, remained in Russian hands, and the eastern theatre of war was sharply divided by a strip of territory, some 140 miles wide, from that in the west.

This book gives an interesting connected account—the first complete account to appear in either Russia or England—of the operations in the eastern theatre, "the wars of the left wing," as they are called by Russian writers.

In 1801 Georgia was annexed by Russia. The following 28 years were occupied by wars against Persia and Turkey, and it was in 1830 that the Russians first seriously applied themselves to the subjugation of the hill tribes. In 1834 Shamil, as third *Imam*, placed himself at the head of the movement called Muridism, which, while originally purely religious, was developed for patriotic purposes to unite the tribes against the Russian invader.

Up till 1845 the Russians confined their operations to isolated expeditions, which produced no lasting impression. In 1845 Prince Vorontsov first initiated the policy of advancing the Russian lines slowly and steadily towards the centre of the disaffected district, and there stifling the revolt at its heart. This policy at length succeeded, and Shamil was surrounded and taken prisoner at Gunib on the 6th September, 1864.

The resistance of the mountain tribes of the Caucasus was the most formidable obstacle that Russia has yet met in her expansion towards the Middle East. Her subsequent advance through the level plains of Trans-Caspia to the northern frontier of Afghanistan has been accomplished with comparatively little loss.

The reader cannot fail to be struck by the remarkable resemblance of these mountain tribes to the Pathans on our own north-west frontier in India. Both are brave, proud, hospitable; both are alike in their fanaticism, passionate love of liberty, and in their harsh treatment of women. It is interesting to imagine, in the light of the difficulties in which Russia was involved in the Caucasus, what our experiences would be in India were it decided to advance the present administrative boundary up to the Durand line and bring the border tribes under our direct rule.

The description of the various engagements is interesting. In the northerly district of Chechnia the operations consisted of wood fighting. The Russian columns moved with patrols and scouts thrown out on all sides and camped at night in square formation, with infantry and artillery on the flanks and cavalry and transport in the centre. The Chechens constantly harassed the flank guards, but seldom succeeded in reaching the main column. They placed their main reliance on the beech woods of the country, and were eventually conquered more by the axe than by the sword. The *auls*, or villages, of Daghestan were built on sites where they could not be commanded from more elevated points within range of the guns then in use. They could be subdued only by storming, and, as the Muridis fought to the last and the houses were arranged to enfilade one another, this storming was a formidable business.

POLITICAL.

PRINCE BÜLOW AND THE EMPEROR WILLIAM II. (Fürst Bülow und Kaiser Wilhelm II.). By Rudolf Martin. 287 pp. 12mo. Leipzig, 1909. Bruno Volger. 4s.

This book is a very severe criticism on the management of German politics by Prince von Bülow, especially as regards his conduct in the affair of the famous "interview" which appeared in the *Daily Telegraph* of November, 1908.

The author asserts that it was Mr. Harold Spender who compiled the "interview" in question, that the document was submitted by the Kaiser to Prince von Bülow for a report on its contents, and that the latter was guilty of grave negligence in failing to examine it. The interview, says Herr Martin, never really took place, but is a combination of alleged conversations of the Emperor in the course of his residence at Highcliffe in 1907. The version of these conversations, given in the *Daily Telegraph* "interview," is far from authentic, and Mr. Harold Spender's information was evidently not obtained at first hand, but more probably from German sources.

The first chapter, which is entitled "Bernhard von Bülow in World Politics," contains an account of the Chancellor's political career.

The writer contends that while everyone must agree that von Bülow is one of the most accomplished statesmen of the present day, yet his management of political affairs has not

been remarkable for its success. The most prominent features of the Chancellor's term of office are described as the dislocation of the Imperial finances, the diminution of the national wealth by the granting of large loans to Russia, the revolt in South-West Africa, and the slow progress in the development of the navy.

He further states that the November events have resulted in diminishing the esteem in which the Kaiser has hitherto been held by his subjects.

The political state of Germany, before the November events, is dealt with in detail in the second chapter of the book. Herr Martin then depicts the events of the first few years of the present Emperor's reign, when Prince Bismarck was Chancellor. Next follow some interesting passages regarding the Kaiser's abilities, tendencies, opinions, his religious sentiments, and his endeavours to further the cause of art and science. He has given special attention to the development of the navy, and it is to a great extent due to him that the shipbuilding law, extending to the year 1917, was adopted in 1900.

The Kaiser, says Herr Martin, has from the beginning of his reign fully comprehended the value of Helgoland. Had Great Britain retained Helgoland in her possession she would have been able to blockade the mouth of the Elbe as well as that of the Weser, but, thanks to the Kaiser's foresight, Germany will now be able to make use of that island as a point of support in time of war with England or with France. Helgoland will, he thinks, gain enormously in value with the expansion of Germany's aerial fleet.

The Kaiser made the greatest mistake of his reign, according to Herr Martin, in neglecting to accept the resignation of Prince von Bülow in October, 1908.

It is this forbearance, he asserts, which has done most injury to his power and which has exposed him to most unjust criticism. From the 17th November, 1908, it appeared to the world as if public power had been transferred from the Kaiser to the shoulders of the Chancellor. But even to-day, thinks Herr Martin, if the Emperor would only consent to the dismissal of Prince von Bülow, he would once again enjoy his hereditary and constitutionally guaranteed Imperial rights.

All those, he concludes, who are desirous of a constitutional government should then insist upon an immediate change in the Chancellorship.

DEFENCE OF THE EMPIRE IN AUSTRALIA. By Colonel Hubert Foster, R.E. 52 pp. Fol. London, 1908. Hugh Rees. 1s. 6d.

Colonel Foster's pamphlet contains a series of eight articles, which together form a most valuable exposition of the true principles of Imperial defence.

The dependence of an Empire such as ours upon sea power is very clearly pictured, but Colonel Foster has been careful to show that there are limitations to the powers of a navy, and that a conclusive result can only be attained by the action on land of military forces.

The manner in which Imperial co-operation is urged, and in which the advantages of the offensive over the defensive have been shown, should commend the book to Imperialists and soldiers, not only in Australia, but throughout the Empire.

STRATEGICAL AND TACTICAL.

LESSONS FROM TWO RECENT WARS. (The Russo-Turkish and South African Wars). By General H. Langlois. Translated for the General Staff, War Office. 145 pp., with 4 maps. 8vo. London, 1909.

Though General Langlois wrote this book five years ago, it is still of considerable value, especially as the Manchurian War has proved the soundness of many of the doctrines enunciated, without refuting any of the principles laid down. The volume was written with a view to preventing French officers from forming incorrect and dangerous conclusions as the result of the war in South Africa. The author is one of a coterie of distinguished French military writers who have been and are striving to imbue their countrymen with the spirit of the offensive, which in their opinion was the cause of the

German victories in 1870-71. The effect produced by the Boer War was to create a feeling in certain circles that the frontal attack had become impossible. As a result of this it seemed likely that French military opinion would veer round to something like its condition in 1870, when so many battles were lost by a want of initiative and a passive defensive attitude. General Langlois therefore set himself to combat these dangerous tendencies by exposing the fallacies of lessons derived from South Africa, further illustrating his contentions by means of examples from the Russo-Turkish War of 1877-78.

He wrote before the conclusion of the *entente cordiale*, so that his criticisms are not blunted by any desire to be polite to us. His tactical ideas, written before the Manchurian War, have been borne out by the success of the Japanese, who acted in accordance with his views. Throughout he lays very great stress on the value of the *offensive*, of *initiative*, of *energy*, and of a determination to conquer; his doctrines are those of our training manuals, with special reference to certain points, which he has brought out with great clearness and ability.

The book is full of valuable criticisms and important lessons. It is divided into five parts, the first dealing with the Russo-Turkish War, the second with considerations regarding the teachings of the French drill book, the third with the Boer War, the fourth with lessons to be drawn from the latter, and the fifth with general considerations regarding present-day tactics.

The author's remarks on the Russo-Turkish War are valuable, especially in the way that they lead up to the discussion on the French drill book in Part II. of the work. This discussion deals more particularly with Skobelev's operations in the fighting about Plevna, with the development of the attack, the fire fight, and the final assault; stress is laid on the importance of adequate artillery support to attacking infantry, and the value of the moral factor is emphasized.

General Langlois divides the South African War into three periods: (1), Before the arrival of Lord Roberts; (2), after his arrival; (3), after his return to England. He maintains that the actions fought by General Buller round Ladysmith, *e.g.*, Colenso, Spion Kop, etc., and by Lord Methuen at Belmont, the Modder River, and Magersfontein, were conducted in defiance of the lessons of 1877-78, and indeed of all tactical rules; he enumerates the various mistakes committed by our leaders, and emphasizes more especially the want of co-operation by the artillery, the faulty notions as to the delivery of the decisive attack, the want of mutual support, the lack of energy and of a determination to conquer. Having demonstrated the fact that our failures were due to these mistakes and not to the increased power conferred on the defence by modern improvements in firearms, General Langlois goes on to make it clear that Lord Roberts' operations, though successful, have little or no bearing on the tactics of European warfare, whilst the guerilla fighting of the third period can be entirely neglected. At the same time however he affirms his opinion that a decisive battle, however costly, would in the long run have proved far more economical in men and money than the cautious measures adopted by the British commanders.

Part IV. deals with the lessons of the South African War, and is an extremely able discussion. The author points out the danger of drawing false conclusions from the Boer War, where the circumstances were peculiar, and quite different to those obtaining in European warfare, where one side was practically composed of irregulars, whilst the tactical methods employed by its opponents were antiquated, vicious, and irresolute. He shows that there is no reason to suppose that frontal attacks will be impossible in the future, with the aid of good leadership and with efficient artillery support; he deprecates the cult of mounted infantry, which he considers to be merely a cheap and bad form of cavalry, and whilst acknowledging the frequent necessity of dismounted action, urges that the *rôle* of cavalry has gained in importance, and that the horsemen of the future require more careful training and must be better riders than ever before. He goes on to deal with German and British tendencies after the South African War, and comes to the conclusion that the Napoleonic system remains the best, *i.e.*, to employ strategy to bring about a battle, during the battle to engage the enemy all along the line, but to drive home the attack at one point. Finally, he discusses our training regulations, compares them with the French regulations, and arrives at the decision that it was failure t observe the principles laid down in our training manuals that led to our checks an

repulses in South Africa. He concludes with a few remarks *re* howitzers, heavy guns, and pom-poms.

The final chapter, dealing with the evolution of tactics, enumerates a few important laws which have been established as the result of the improvements in modern firearms. General Langlois points out that these improvements tend to increase the value of the individual, as opposed to the power of mere numbers, and that energy, *moral*, and determination to conquer will play an even greater part in future wars than has been the case in the past.

THE SURPRISE ATTACK BY SEA AS A PRELIMINARY TO A CAMPAIGN (Der Ueberfall über See als Feldzugseinleitung). By Lieut.-General A. von Janson. 144 pp., with 14 sketch maps and plans in the text. 8vo. Berlin, 1909. Eisenschmidt. 4s.

The question of an invasion by sea is one of the most discussed topics of the present day. This is to some extent due to the important part played by the Japanese fleet in the recent war against Russia. In this book various oversea expeditions which have taken place in the past are dealt with, and the lessons to be learnt from them are discussed.

Napoleon said: "To try and effect a landing in England without having command of the sea would be the boldest and most difficult operation that could be attempted." Nevertheless the French expeditions to Ireland and Egypt prove that under favourable circumstances it is possible for a nation not having command of the sea to land troops.

The telegraph and other modern inventions prevent preparations for such expeditions being kept secret at the present day, but otherwise the author considers that the improvement in ships, armaments, etc., confer equal advantages on the assailant and defender. No modern ruler or general has given more attention to the question of invasion than Napoleon, and yet he was only successful once (Egypt). Even on this occasion, had not the French fleet been destroyed, it is questioned whether the expedition would have had any lasting results. Napoleon succeeded in transporting an army all the way to Egypt, and yet hesitated to cross the Channel, because England had command of the sea. The author therefore concludes that what Napoleon, who was much more favourably situated, was incapable of doing could not be done by anyone at the present day, and also that oversea invasion in Europe is practically out of the question. This theory appears to be confirmed by the Russo-Japanese War, when the Japanese hesitated to land on hostile territory until they had gained command of the sea, notwithstanding the fact that they had surprised their opponents both politically and strategically.

It is not considered that any Power could collect sufficient transports to carry in one trip an army of sufficient size to bring a war to a decision. The author considers that railways are a great safeguard against such landings, and that a country which has made the necessary preparations for its own defence in peace time has nothing to fear from oversea attacks. This he considers a much greater safeguard than International conventions.

GENERAL CARL VON CLAUSEWITZ ON WAR. Translated by Miss Maguire, with notes by T. M. Maguire. 161 pp., with 2 maps. 8vo. London, 1909. Clowes. 7s. 6d.

This book consists of a series of articles published originally in the *United Service Magazine*.

The selected extracts from this distinguished authority on the art of war have been freely translated, and in many instances only a *précis* of the original text is given. Interspersed throughout the articles are copious comments and notes by Mr. Maguire, who has drawn on British methods and military history, as far as possible, by way of illustration.

STUDIES OF WAR (Studien über den Krieg). Part III. Strategy. By General of Infantry J. von Verdy du Vernois. 99 pp., with 3 maps in text. 8vo. Berlin, 1909. Mittler. 2s. 6d.

This is the eighth number of the series and the third section of the second group dealing with strategical operations. The subject dealt with in this number is the "Strategical Concentration," with comments on von Moltke's appreciations on the question.

The author points out in the introduction that concentration must be considered under the headings of strategical and tactical, and illustrates his arguments from the campaigns of 1859, 1866, and 1870.

SOME PRINCIPLES OF FRONTIER MOUNTAIN WARFARE. By Brevet Major W. D. Bird, D.S.O. 41 pp., with 2 plans. 8vo. London, 1909. Rees. 1s.

A brief treatise on the rules to be observed in campaigning on the North-West Frontier of India. Divided as follows:—

(1). General considerations.
(2). Strength and organization of columns.
(3). Marches and protection.
(4). Action of advanced and rear guards.
(5). Attack and defence.
(6). Camps.
(7). Protection of lines of communication.
(8). Defence of a post.

Under the above headings the writer considers how dispositions are affected by the nature of the country and the military capabilities of the tribesmen; by space occupied by columns on narrow hill tracks, and the probabilities of resistance; the protection of columns by picqueting hills, and the disposition of troops on the line of march and in advanced and rear guards; the precautions to be observed in posting and withdrawing picquets; the occupation of successive positions by rear guards; the importance of offensive action and flanking movements; how best to bring the tribesmen to action so as to inflict losses upon them; the importance of systematic defence in withdrawal. The part on camps deals with their form and choice of situation, picqueting, the nature of entrenchments, and the disposition of the three arms. The part on the protection of lines of communication discusses the relative use of defensive posts and flying columns.

PROVISIONAL REGULATIONS REGARDING THE METHODS OF CROSSING AND DESTROYING OBSTACLES (Instruction provisoire sur les procédés de franchissement et de destruction des obstacles de la fortification). Official publication issued by the French War Office. 47 pp. 8vo. Paris, 1908. Imprimerie nationale. 10d.

The object of these regulations is to indicate the technical rules to be followed, the implements to be employed, and the formations to be adopted by detachments who have to cross or destroy obstacles in the presence of the enemy.

The regulations are divided into three parts, namely:—

First part, dealing with the crossing and the destruction of the principal accessory defences.

Second part, dealing with the crossing of ditches and surmounting of stockades and railings.

Third part, dealing with the destruction of stockades and railings.

It is laid down that obstacles can as a rule only be crossed or destroyed at night, though instances may occur when it may be necessary to attempt such operations in daylight under cover of artillery and rifle fire. The regulations insist that in any case it is absolutely necessary that the work must be carried out with very great rapidity, and that the plan for reaching the obstacles must be very simple. The clearest orders are given as to the strength of detachments sent out to destroy obstacles, the *matériel* they are to take with them, and the simplest method of carrying out each particular class of demolition.

The regulations are illustrated by means of clear diagrams.

TRAINING AND EDUCATION.

MISTAKES IN THE SOLVING OF TACTICAL PROBLEMS. By Lieut.-Colonel J. Layland Needham. 66 pp. 8vo. London, 1909. Rees. 1s. 6d.

This is the second edition of this little work. It is a useful collection of the more frequent mistakes committed by candidates in the tactical papers set in examinations for promotion, as pointed out by the examiners in their reports, with explanatory notes by the author.

The example of orders given on pages 65—66 is not quite in accordance with *Field Service Regulations*, Part I., which has been issued since the publication of this book.

FORTIFICATION AND MILITARY ENGINEERING.

ARMOUR IN FORTIFICATIONS (Fortification cuirassée). By Lieut.-Colonel L. Piarron de Mondésir. 360 pp. 8vo. Paris. Octave Doin. 4s. 2d

The author traces the effect of the introduction of melinite more than 20 years ago, and shows how metal has come to be employed in fortifications in order to furnish protection to the guns and gun detachments, and to observation parties and sentries. The book is divided into two parts, the first of which deals with the improvements in weapons in the XIXth century, and the effect produced by these on fortifications. The second part deals with the employment of armour in fortifications at the present time in France.

A TREATISE ON PERMANENT FORTIFICATION (Étude sur la Fortification Permanente). By General Dupommier. 56 pp., with 1 plate. 8vo. Paris, 1907. Berger-Levrault. 1s. 8d.

This book contains four chapters, dealing respectively with the *rôle* generally played by permanent fortifications, with "forts d'arrêt," fortifications as a means of protection, and "covering" fortifications.

BOOKS OF REFERENCE.

THE TERRITORIAL YEAR BOOK. 294 pp. 8vo. London, 1909. Hodder & Stoughton. 2s.

This book deals primarily with the constitution, organization, administration, and distribution of the Territorial Forces, but there is also a considerable amount of up-to-date information on matters of general military interest.

It contains lists of the Military Forces of the Crown, the principal ships of the Royal Navy divided according to classes, regiments of the Army, with historical notes, Territorial units, and county associations.

Maps have been supplied, showing the division of England, Scotland, and Wales into Territorial commands, districts, etc., and coast defence zones.

It will be found a useful and interesting publication by all, but especially by members of the Territorial Force.

TRAVEL AND TOPOGRAPHICAL.

THE SHORT CUT TO INDIA. David Fraser. 381 pp., with 90 illustrations, maps, and sketches. 8vo. Edinburgh and London, 1909. Blackwood. 12s. 6d.

This is an entertaining and instructive account of a journey along the route of the Baghdad Railway. The chapter dealing with the railway convention and the last four chapters dealing with the route of the railway, the population question, mail contract and gulf shipping, and the general question of the railway are of peculiar interest from a military point of view.

MISCELLANEOUS.

GERMAN SECRET SERVICE IN FRANCE (L'espionnage allemand en France). By Paul Lanoir. 250 pp. 8vo. Paris, 1908. Cocuaud & Co. 3s.

An interesting work, showing the organization, ramifications, and working of the German secret service system, from 1848 up to the present day, with special reference to the methods of Stieber. This extraordinary man, for many years head of the Prussian secret police, organized a most efficient system of spies in Austria and France before the campaigns of 1866 and 1870 respectively, and the work of these agents contributed in no small degree to the success of the Prussian and German armies in these wars.

The author goes very deeply into the German methods of secret service, and the information given by him is of considerable value, as it shows the thoroughness of the German system, and the lengths to which Germans are prepared to go when they require intelligence about a country on which they intend to make war. The details of present-day German methods are most instructive, and the book is well worth reading.

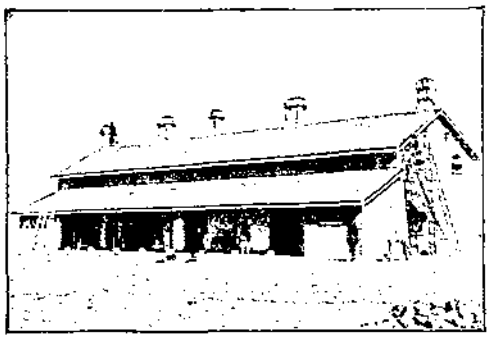
RUBEROID!
ROOFING!

A High Grade Permanent Roofing Material in general use for all classes of Buildings. Its light weight as compared with other roof coverings makes it particularly useful where long transport of building materials is necessary.

THOROUGHLY TESTED FOR ALL CLIMATES.

Supplied to H.M. WAR OFFICE for

GIBRALTAR, SIERRA LEONE, CHATHAM, MAIDSTONE, PORTSMOUTH, BANTRY BAY, Etc.



Orderly Room, Infantry Lines, Quetta, Beloochistan.

Unaffected by Concussion of Gun Fire.

—:o:—

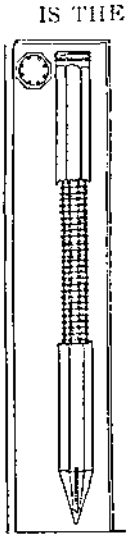
CAN BE LAID on all kinds of ROOFS, FLAT OR PITCH, CONCRETE OR WOOD.

Full particulars of cost and shipping weights gladly supplied. Our Illustrated Catalogue, No. 39, and samples sent post free on application.

THE RUBEROID COMPANY, Limited, 81 & 83, Knightrider St., LONDON, E.C.

THE CONSIDERE SYSTEM
OF
REINFORCED CONCRETE

IS THE MOST SCIENTIFIC METHOD AT PRESENT IN USE.



CONSIDERE SPIRALLED ARMOURING gives a three times greater increase to the compressive strength of concrete than any other system.

It is specially applicable and economical for the construction of PILES, COLUMNS, BRIDGES, and WAREHOUSES.

CONSIDERE PILES *can be driven without any cushion or elastic cap of any kind.*

Preliminary designs, with approximate estimates, submitted for consideration free of charge. Complete working details and instructions for work in British Colonies at specially low fees.

For Pamphlet, Illustrations, and further particulars write

The CONSIDERE CONSTRUCTION Co., Limited, 5, Victoria St., Westminster, London, S.W.

R.E. INSTITUTE

New Publications.

MANUAL OF

Road Construction & Maintenance

Compiled at the S.M.E., by MAJOR PAUL, R.E.

FULLY ILLUSTRATED.

Price **4s. 6d.**, Post Free. Members of the R.E. Institute, **3s.**

ABBREVIATED NOTES

ON

Military Engineering

CONTENTS:

Ropes, Spars, Tackles, Strength of Materials, Bridging, Field Defences, Camping Arrangements, Demolitions, Roads.

POCKET BOOK SIZE. INTERLEAVED.

Price **6d.**, Post Free.

THE PICTURES AND PLATE

OF THE

R.E. Headquarter Mess,

CHATHAM.

REPRINTED FROM THE "R.E. JOURNAL" AND PROFUSELY ILLUSTRATED.

Bound in Cloth. Price **2s. 6d.**; by Post, **3d.** extra.

PROFESSIONAL PAPERS OF THE CORPS OF ROYAL ENGINEERS.

FOURTH SERIES.—VOL. I., 1905.

PAPER I. **Simple Tunnel Work on the Mari-Attock Railway, Panjab,** by Capt. H. E. C. Cowie, D.S.O., R.E. ..... 1s.

,, II. **Long Span Bridges,** by Max am Ende, M. INST. C.E. ..... 1s. 6d.

,, III. **Recent Works in the N.W. Frontier Province, India** (Fortified Posts, Roads, Bridges, Civil Buildings), by Bt.-Col. G. K. Scott-Moncrieff, C.I.E., R.E. ..... 3s. 6d.

,, IV. **Armoured Trains,** by Capt. H. O. Mance, D.S.O., R.E. ..... 3s. 6d.

,, V. **Reinforced Concrete,** by Lt.-Col. J. Winn, late R.E. ..... 2s. 6d.

,, VI. **Fortress Warfare,** by Capt. Moritz Ritter von Brunner. 9th edition of the work originally written by Field Marshal von Brunner. Translated by Capt. C. Otley Place, D.S.O., R.E. ..... 3s. 6d.

,, VII. **Fortresses and Military Engineering in Recent Literature.** No. 43 of the "Mitteilungen des Ingenieur-Komitees." Translated by Capt. F. A. Buzzard, R.F.A. ..... 5s.

VOL. II., 1908.

PAPER I. **The Theory of Arched Masonry Dams,** by Capt. A. H. Garrett, R.E. ..... 1s. 6d.

,, II. **Report on Mechanical Road Transport for India,** by Capt. E. N. Manley, R.E. ..... 2s.

,, III. **The Khushalgarh Bridge,** by Capt. H. E. C. Cowie, D.S.O., R.E. ..... 2s. 6d.

The price of separate Papers as above, in paper wrappers, is net.

They may be obtained from Messrs. W. & J. MACKAY & Co., LTD., Chatham, or from any Bookseller.

"ANCHOR" LINE.

Passenger and Cargo Services.

LIVERPOOL to BOMBAY & KARACHI (*viâ* Bombay). Fortnightly.

LIVERPOOL to CALCUTTA. Fortnightly.
All Vessels call at Egyptian Ports.

Large New Steamers. Splendid Accommodation for Passengers. Electric Light and Fans. Excellent Cuisine. Every Comfort. Moderate Fares, both Single and Return.

Apply—"ANCHOR" LINE (Henderson Brothers', Ltd., Liverpool, London, Glasgow, &c.

Nippon Yusen Kaisha.

Japan direct from London in 47 days, calling at COLOMBO, SINGAPORE and HONG KONG, by fast steamers fortnightly.

KAWACHI MARU, October 2nd.
*KAMO MARU, October 9th.
SANUKI MARU, October 16th.
AWA MARU, October 30th.

* This new steamer will call at Marseilles.

To Japan, £54, 1st Class; £37 10s., 2nd Class; to other Ports at equally moderate rates. London to Marseilles, £9 1st Class, £6 2nd Class.

ROUND THE WORLD, £107.

For Fares, etc., apply at—
4, Lloyd's Avenue, London, E.C.

Institution SILLIG,

BELLERIVE,
VEVEY, SWITZERLAND.

ESTABLISHED IN 1836.

A HIGH-CLASS SCHOOL for the education of Boys in Classical, Scientific, Military, and Commercial Subjects, and for General, Moral, Mental, and Physical Development.

PRINCIPAL:

MAX SILLIG—DE VALLIÈRE.

THE ARMY SCHOOL,

Near MAIDENHEAD

(Approved by the Army Council.)

Head Master:

E. G. A. Beckwith, M.A. Oxon.
(Late Exhibitioner of Winchester and Magdalen College).

"A small public school in which boys from the age of twelve are prepared for the Army. The school buildings include a chapel, large dining hall, swimming bath, gymnasium, chemical and physical laboratories, besides 32 acres of playing ground."

SUCCESSES, JULY, 1908—JULY, 1909.
Woolwich—Three (first trials).
Sandhurst—Twelve.
A Cadet Corps has now been formed.

For FEES, etc. (reduced for Sons of Officers, with *further* special reduction for Sons of R.E.'s), apply to the Head Master.

NAVIGAZIONE GENERALE ITALIANA.

The fine steamers "R. RUBATTINO" and "D. BALDUINO" sail alternately from GENOA TO BOMBAY on the 18th of each month, at 2 a.m.

FARES: 1st Class, £40 & £33; 2nd Class, £27 10s.; 3rd Class, £11.

GENOA TO ALEXANDRIA every Saturday, at 9 p.m.

NAPLES TO PALERMO every Evening, at 7·25 p.m.

For Tickets and Berths apply to the Co.'s Agents—
ALFRED LAMING & CO.,
8, Leadenhall Street, E.C.

NOTES
FOR THE
TACTICAL FITNESS EXAMINATION,

With Sample Schemes and Solutions,

By Major A. T. MOORE, R.E.

PRICE
TWO SHILLINGS AND SIXPENCE,
Post 3d. Extra.

Obtainable from the Secretary, R.E. Institute, Chatham, and Rees, Limited, 119, Pall Mall, S.W.

G. E. CARRINGTON,

For many years Master Tailor, Royal Engineers,

TAILOR & MILITARY OUTFITTER,

53, HIGH STREET,
OLD BROMPTON, KENT,

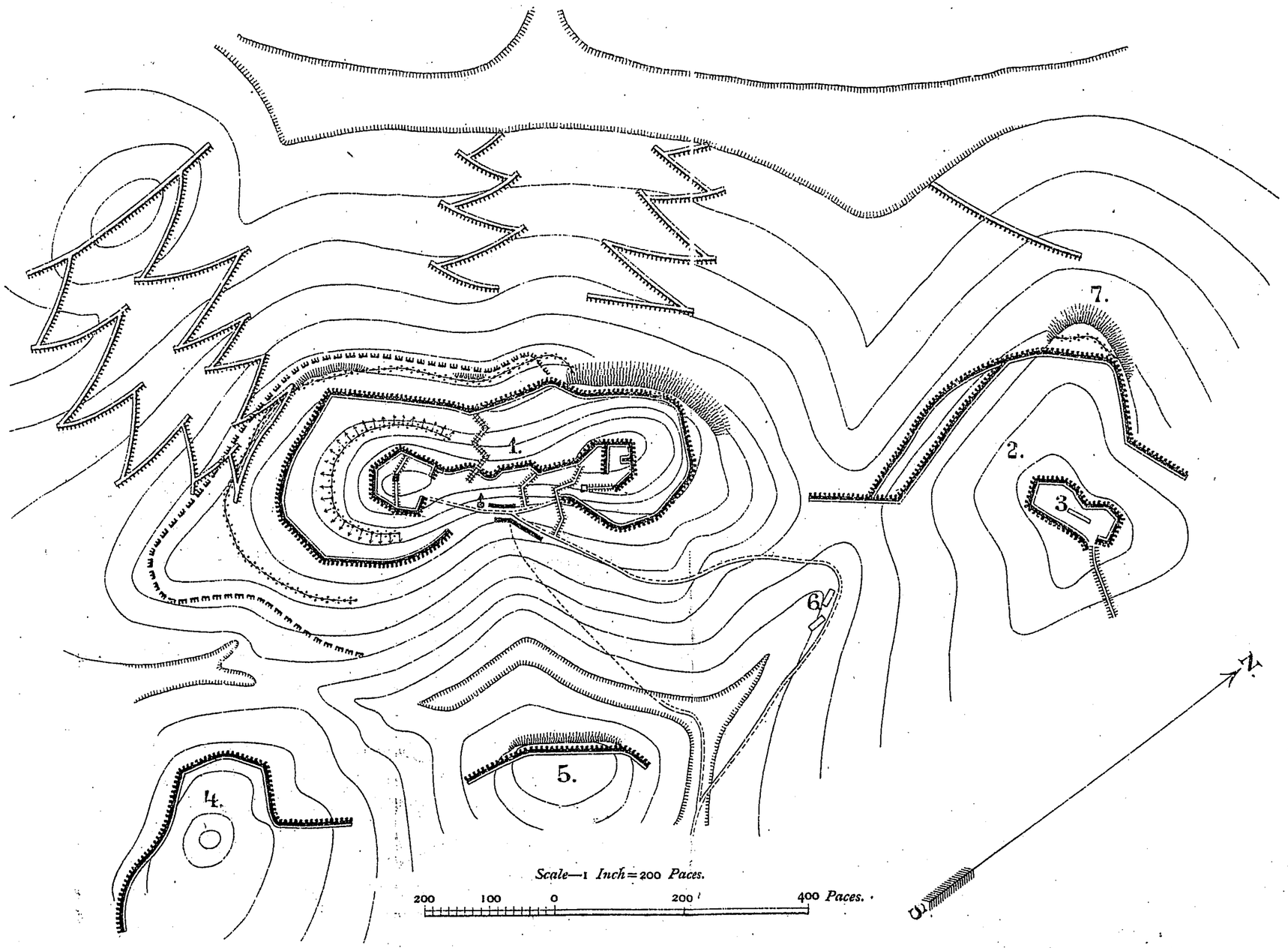
Attends CARLTON HOUSE, REGENT STREET, near Waterloo Place, S.W., every TUESDAY and THURSDAY, from 11 a.m. to 6 p.m., and at any other time by appointment.

DEFENCES OF VISOKAYA, LEFT FLANK OF FLAT AND RIGHT FLANK OF FALSE HILLS, AND SIEGE WORKS OF JAPANESE AT TIME OF NOVEMBER ATTACK.

Conventional Signs.

- *Trenches.* — *Russian.*
- *Trenches.* — *Japanese (sapps).*
- *Capt. Smirnov's trench, filled in after September attack.*
- *Communication trenches.*
- *Covered ditto.*
- *Wire entanglement.*
- *Ditto and abattis.*

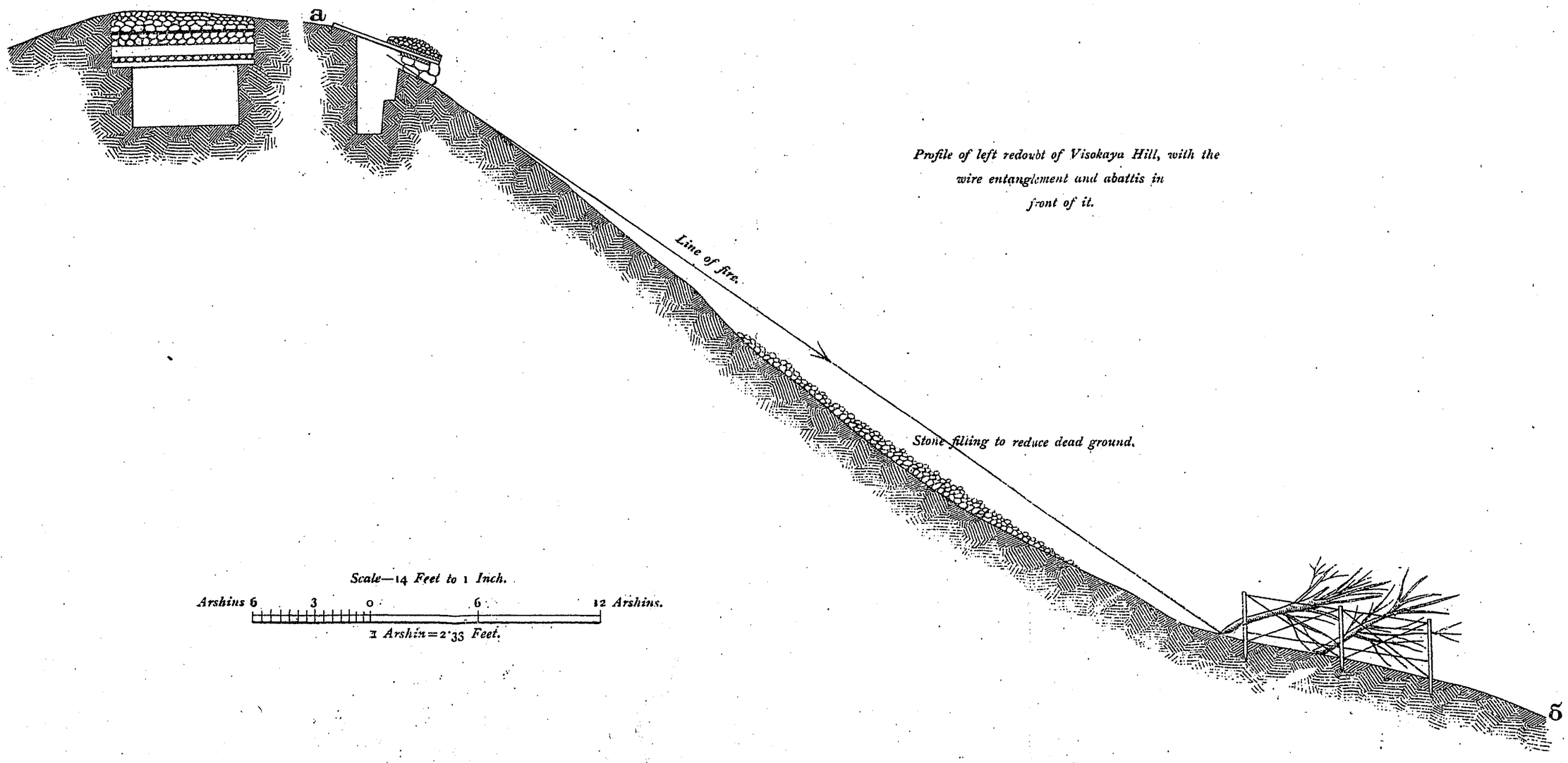
1.—*Visokaya Hill.*
2.—*Flat Hill.*
3.—*Stony Redoubt.*
4.—*False Hill.*
5.—*Nameless Hill.*
6.—*Dug-outs for the companies occupying left flank of Flat Hill and the Saddle.*
7.—*Dead ground.*



Scale—1 Inch = 200 Paces.

200 100 0 200 400 *Paces.*

Central blindage.



Profile of left redoubt of Visokaya Hill, with the wire entanglement and abattis in front of it.

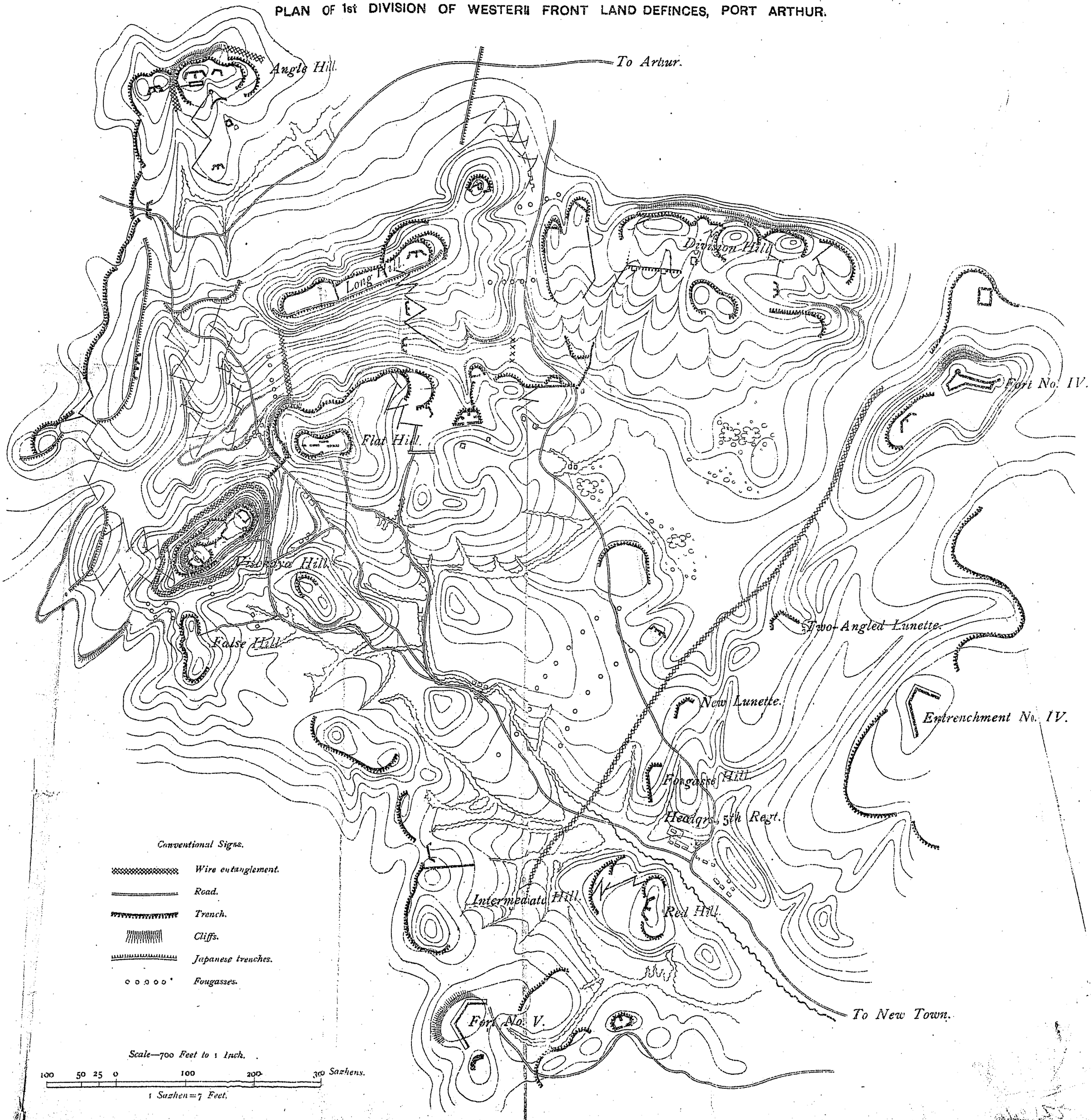
Stone filling to reduce dead ground.

Scale—14 Feet to 1 Inch.

Arshins 6 3 0 6 12 *Arshins.*

1 Arshin = 2·33 Feet.

PLAN OF 1st DIVISION OF WESTERN FRONT LAND DEFINCES, PORT ARTHUR.

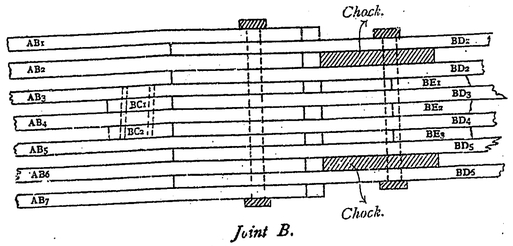


A PLANK GIRDER BRIDGE.

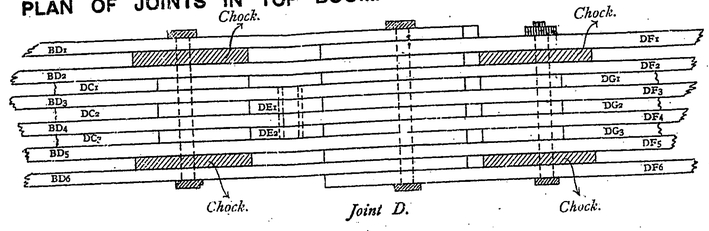
References :—

- AB1, 2, 3, 4, 5, 6, *and* 7. — *Top Boom.*
- BD1, 2, 3, 4, 5, *and* 6. — *Top Boom.*
- DF1, 2, 3, 4, 5, *and* 6. — *Top Boom.*
- BC1 *and* 2. — *Verticals.*
- DE1 *and* 2. — *Verticals.*
- FG1 *and* 2. — *Verticals.*
- BE1, 2, *and* 3. — *Diagonals.*
- DC1, 2, *and* 3. — *Diagonals.*
- DG1, 2, *and* 3. — *Diagonals.*
- FE1, 2, *and* 3. — *Diagonals.*
- AC1, 2, 3, 4, 5, *and* 6. — *Bottom Boom.*
- CE1, 2, 3, 4, 5, *and* 6. — *Bottom Boom.*
- EG1, 2, 3, 4, 5, *and* 6. — *Bottom Boom.*

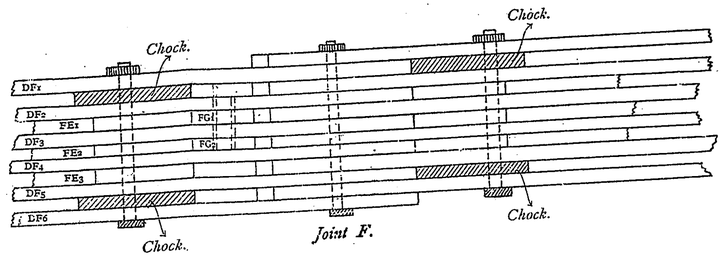
PLAN OF JOINTS IN TOP BOOM.



Joint B.

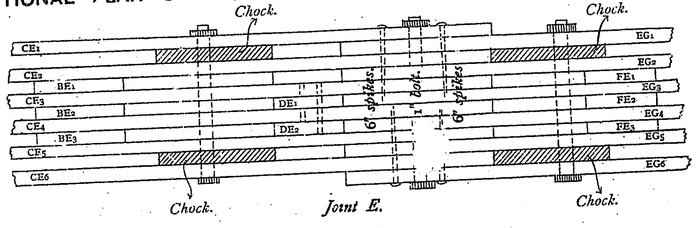


Joint D.

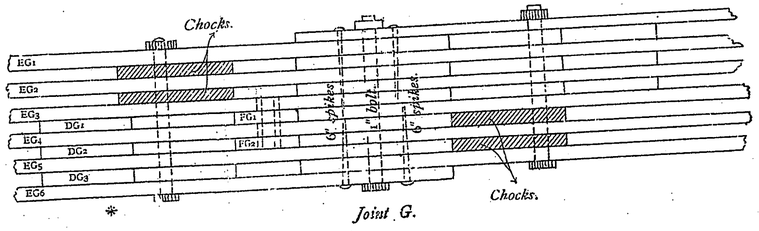


Joint F.

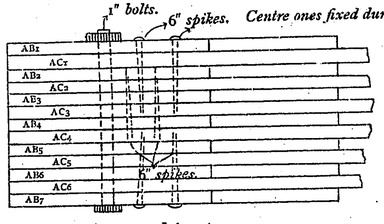
SECTIONAL PLAN OF JOINTS IN BOTTOM BOOM.



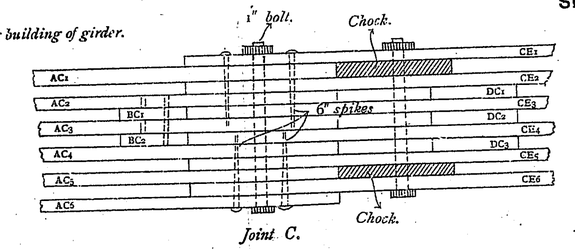
Joint E.



Joint G.



Joint A.



Joint C.

Sections taken 6" above bottom boom.

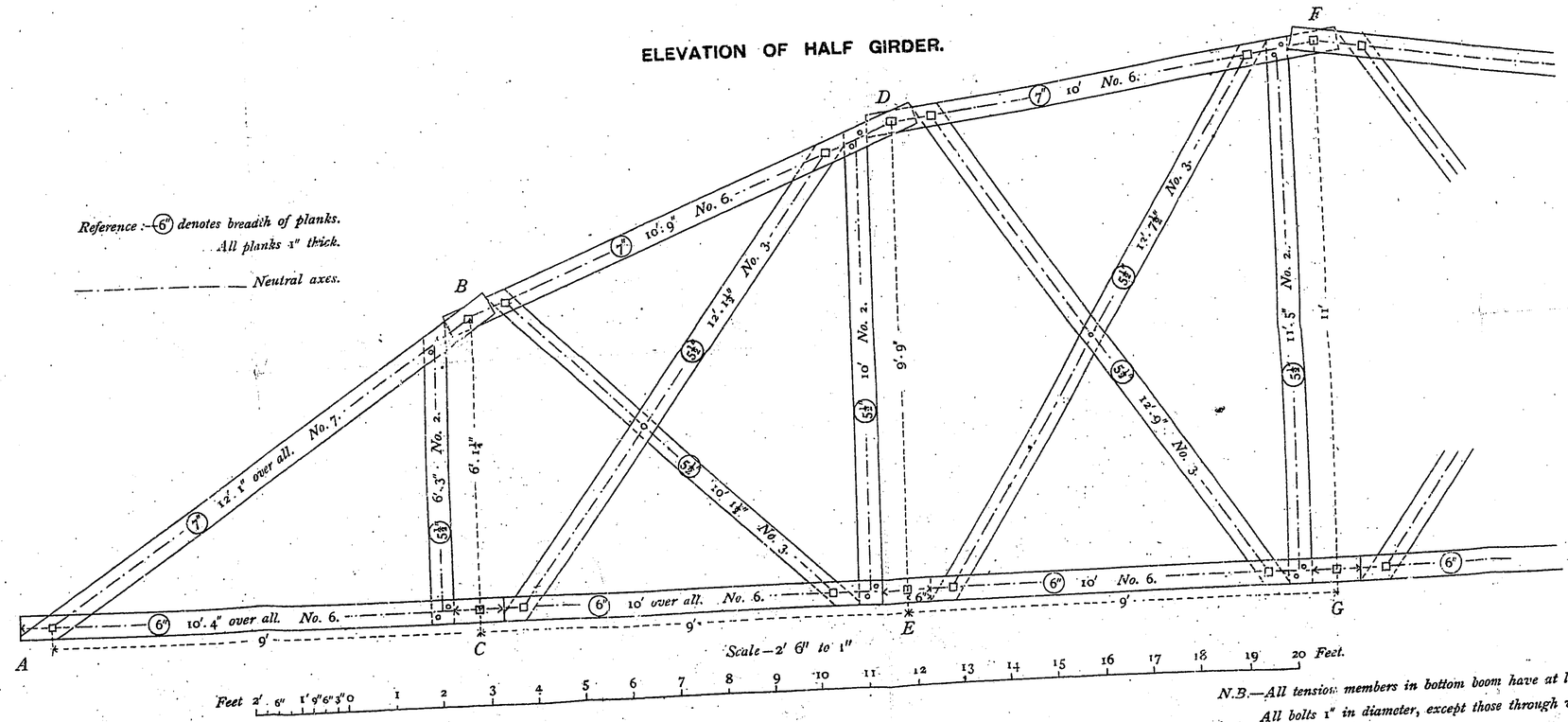
Scale—$\frac{1}{10}$

Inches. 12 9 6 3 0 — 1 — 2 — 3 *Feet.*

* *The necessity for the placing of these diagonal ends out of centre will be seen if the interlacing of the planks is followed out.*

All diagonals and verticals have a tilt of one plank thickness=1" in their total length.

ELEVATION OF HALF GIRDER.



N.B.—All tension members in bottom boom have at least 6" overlap beyond bolt.

All bolts 1" in diameter, except those through verticals, two at each end, ½" in diameter.

The McKenzie, Holland, &
Westinghouse Power Signal Co., Ltd.

POWER SIGNALLING

Electro-pneumatic,
all-electric, and
automatic signalling.

Address:

58, VICTORIA STREET, LONDON, S.W.

Telegrams: "POWERSIG, LONDON." Telephone: 890 Westminster.

PORTLAND CEMENT.

CONCRETE FIRE-PROOF SLABS.

For Internal and External Walls.
As cheap as any other, with the following advantages :—

ECONOMY OF SPACE, GOOD KEY FOR PLASTER TILING, ETC., NO PLUGGING, AND SETTING COAT OF PLASTER ONLY REQUIRED.

For Particulars and Prices apply to :

THE ACTON CONCRETE PATENT PARTITION CO., 1909, Ltd.,

Telegrams: "KONKREET, LONDON."
Telephone: 6294 AVENUE.

63, CORNHILL, LONDON, E.C.

THE OFFICE FOR OFFICERS.

LIFE ASSURANCE. Specially designed for the Services.
CONVENIENTLY PAID FOR by Bankers' Orders (Monthly Premiums if desired).
NO MEDICAL EXAMINATION up to £500, in ordinary circumstances.
LOANS AND SURRENDER VALUES. Liberal and easy conditions.
EXCEPTIONALLY GOOD TERMS for War Risks and Foreign Residence.

Call or write for new Service Prospectus.

Royal Exchange Assurance, (Incorporated 1720.)
West End Office: 44, PALL MALL, S.W.

THE

Royal Engineers Journal

Can now be obtained at

Messrs. HUGH REES, Ltd.,

119, Pall Mall, S.W.

BULLIVANT & CO., Ltd.,

Manufacturers of

STEEL WIRE ROPES

FOR

CRANES, LIFTS, HOISTS, SUSPENSION BRIDGES, HAULING, Etc.

DURABLE AND RELIABLE.

Contractors for . . . .

AËRIAL ROPEWAYS

Specially designed for conveying Stores, Munitions, etc., across Rivers, Ravines, etc. Can be quickly and easily erected and dismantled. Suitable also for conveying Passengers.

BLOCKS, PULLEYS, TACKLE, AND ALL WIRE ROPE APPLIANCES.

Regd. Office, **72, Mark Lane, London, E.C.**

Works, **Millwall, E.**