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Index to Authors.

(Memoirs and Reviews Omitted.)

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MAJOR-GENERAL SIR WILLIAM REID
GCMG, KCB, FRS, RE

THE MILITARY USES OF THE AEROSTAT.

By Capt. P. W. L. Broke-Smith, R.E.

The following consideration of the military uses of the aerostat is published in the hope that it may be of general interest. It was, however, originally written some months ago, and events develop very rapidly in the aeronautical world, hence it is not claimed that the study is up to date in every particular.

In preparing the study recourse has been had to an article which appeared in the *Bulletin de la Presse et de la Bibliographie Militaire.*

Portions of the notes are based on articles which were published in the *Streffleurs Militärische Zeitschrift* and the *Gazette de Cologne.*

The opinions expressed may, therefore, be generally considered to be in agreement with the accepted ideas of at any rate one school of thought in both France and Germany.

Since the recent attainment of success in the dirigibility of aerostats, a number of writers on military subjects have put forward, in their enthusiasm, what may be described as rather exaggerated expectations as to the effect of the command of the air on the conduct of war. Practical experience and a deeper study of the question must, however, give birth to more considered ideas.

By the side of the incontestable advantages of dirigible balloons, it must be recognized that there exist also inconveniences, and that the service of strategic reconnaissance, the most important service of airships in war, will not be effected without difficulties. Already all the most important firms who are engaged in the manufacture of artillery have bethought themselves of field pieces, carried on automobiles, capable of firing shrapnel and suitable shells which will keep dirigibles at a respectful distance.

Besides, there are the elements against which they must fight :— the wind, the storm and the fog.

The object of this study is to bring into focus, ideas as to the value of the dirigible aerostat as an engine of war.

The Dirigible Balloon.

The possibility of travelling through the air in a dirigible balloon, at a great height and in a freely chosen direction, has given rise to the idea that one could launch from the altitude of these aerostats

immense quantities of explosives, sow terror and disaster in the ranks of the enemy, rapidly transform modern armoured works into heaps of ruins, or send the most powerful Dreadnoughts to the bottom of the sea in a few instants.

In reality, far less must be expected.

A medium-sized military dirigible has a capacity of about 85,000 cubic feet. This capacity would appear considerable if we consider that in order to permanently shelter the Austrian airship, which is of this size, a shed is required which has cost nearly a quarter of a million crowns, to which expenditure must be added the cost of the manufacture of the gas necessary to maintain the balloon well inflated.

On the other hand, this capacity is small if we consider that such a dirigible cannot carry much beyond the *personnel* necessary for its management and for reconnoitring work, and indispensable ballast.

If it were desired to provide such a balloon with an installation of wireless telegraphy, to make it capable of carrying a certain quantity of explosives, and to furnish it with motors sufficiently powerful to allow it a very rapid rate of advance, its volume would have to be considerably increased. Such dimensions would result that the balloon would be visible at distances up to over 15 miles in clear weather. Once discovered, such a balloon would become, to the great danger of its passengers, the object of the constant attention of the artillery officers, who would not neglect to open fire as soon as the balloon arrived within range of their guns, viz. about 5 miles.

The balloon would then have to advance for from 8 to 10 minutes after coming within range, before aiming at the point which it wished to attack.

As a quick-firer can discharge 8 to 10 shots a minute (with a well-trained *personnel* it is stated that a rate of 10 shots in 24 seconds can be attained), and as the artillery of neighbouring works, intermediate batteries, etc., would intervene equally in the fight, the balloon would need enormous luck to be able to pass through this hail of projectiles without being damaged.

If, however, it could manage to reach the target keeping at an altitude of over 6,000′ its crew would have to decide the precise moment at which to launch the explosives.

When an object is dropped from a height of 6,000′ it takes, without considering the resistance of the air, about 20 seconds to reach the ground. But the balloon has acquired a velocity of its own—40′ per second, or over 25 miles per hour for example. This velocity is equally possessed by the object launched from the balloon.

Consequently, the bomb will in its fall describe not a straight line but a curve. In the example given during a fall of 20 seconds it will travel about $40 \times 20 = 800'$ horizontally.

It will, then, be necessary for the explosives to be launched before the balloon passes over the target, and to determine the moment of discharge it will be necessary to calculate each time the exact height of the balloon, its speed, the influence of the resistance of the air and of the independent velocity and direction of the wind, etc.

Suitable tables and diagrams to suit various conditions of height, speed, independent wind velocity and direction, etc., will have to be prepared beforehand and carried on board the airship, in order that with their aid it may be possible to determine the distance in front of the target at which the bomb should be discharged. It appears, however, that the determination of this point can never be made anything in the nature of an exact science, and all will depend on the last resort on the individual personal instinctive skill of the man discharging the bomb and of the man in charge of the airship. It is of course possible to imagine that the bomb may be discharged in some manner from the airship so as to give it an initial downward velocity. This will straighten out the path of the bomb through the air and will reduce the initial horizontal distance which must be allowed. The muzzle of the discharging apparatus might even be pointed to the rear to a certain degree according to the velocity of the airship, the direction and independent velocity of the wind, etc., and the bomb could then be discharged at the moment of passing over the target.

Unless the airship be of very large dimensions it would appear that the comparatively severe shock attendant upon the discharge of a projectile at a high velocity would be extremely undesirable. This shock would tend to disturb the equilibrium of the airship, even though the actual balance would remain unaffected owing to the discharging apparatus being fixed at a suitable point with respect to the centre of mass and centre of stability.

The sudden loss of a comparatively large amount of ballast by the discharge of a mass of explosive will also upset the equilibrium of the balloon, and necessitate discharge of gas and the balloon rising to and attaining equilibrium at a higher level on every occasion on which a large weight of explosives is discharged. The sudden tendency to rise can of course be counterbalanced by the manipulation of altitude rudders, provided that the airship has a sufficiently high speed of advance with respect to the surrounding air.

It would, therefore, appear that the explosives should be discharged when the airship is moving against the wind, as then its velocity relative to the surrounding air will be comparatively high, giving the rudders a maximum effect, and its actual speed of translation relative to the earth will be comparatively low.

Unless the initial downward velocity of the bomb be great compared with the velocity of the wind, consideration will have to be

given to the direction of the wind in approaching the target. It will probably be essential to discharge it when the airship is moving directly up or down wind towards the target.

It must also be borne in mind that the direction and strength of the wind currents frequently vary considerably at different altitudes, and it can be conceived that in passing through a vertical distance of over 6,000′ the projectile will meet in its course wind currents entirely different in strength and in direction to those prevailing at the altitude at which it was discharged. If these currents are unknown or have not been taken into consideration, and the current at the altitude of discharge only has been considered in working out the point of discharge, it is obvious that unless the initial velocity of the projectile is comparatively great, or the weight of the projectile is comparatively large in proportion to its volume, it will be diverted from its intended course and will strike wide of the mark.

Diversity in the strength and direction of wind currents is, in particular, experienced over large collections of buildings; and the conformation of the ground at all times causes the wind currents at low altitudes to have a tendency to vary in strength and direction from the currents at greater altitudes, which are not so much affected by the contour of the earth beneath.

The relatively small and well-protected modern works would seem to have little to fear from the dirigible balloon, provided that they are furnished with the armament necessary to combat it. However that may be, as soon as it has launched its charge the balloon will have to effect its return through the cloud of projectiles which has been described above.

The attacker will, then, think twice before exposing to the danger of destruction so costly an apparatus, which is irreplaceable during the course of the war, and will hesitate to do so in order to discharge some 7 lbs. of dynamite without certainty of success.

It would be more advantageous to profit by the extreme power of mobility of a dirigible balloon, and to provide it with a wireless telegraphy installation and endow it with powerful motors giving it very great speed.

Thanks to its large radius of action the dirigible balloon would then be eminently adapted to reconnaissance in the widest sense of the word.

It would serve in the first place for strategic reconnaissances undertaken to report the presence or otherwise of the enemy in force within a particular area, as well as the general distribution of his troops. The value of such information would be naturally increased if it reached headquarters through the medium of wireless telegraphy.

Employed with circumspection and skill the dirigible balloon will render very appreciable service.

In the case of a medium-sized non-rigid balloon such as that mentioned, of capacity about 85,000 cubic feet, a shed can on occasion be dispensed with, if necessary, since the deflated balloon, with all its accessories, can be carried on wagons, and follow the army.

For this purpose about 25 four-horse vehicles are required for such a balloon. The quantity of gas thus carried is only sufficient for a single inflation. For every additional inflation about 20 four-horse vehicles would be required, as refills are necessary. As it is equally imperative to provide for the maintenance of the *personnel* and horses, the aerostatic train of an army in the field will reach a very considerable development, and provision for it will have to be made when calculating the mechanical transport requirements of the army.

Small calibre quick-firing guns, constructed so that the muzzle can be pointed up at large angles of elevation, are the most suitable to combat dirigible aerostats.

At a distance of 3 miles and at an altitude of not more than 2,500′, the dirigible balloon can theoretically be cannonaded by the latest field guns. As a matter of fact effective fire at greater distances and at greater elevations is also theoretically possible; but it is then necessary for the trail to be buried in the ground, since the elevating mechanism can no longer give the necessary elevation. If this cannot be done recourse must be had to the howitzer.

The Aeroplane.

In consequence of the important results achieved in the course of one year it may be affirmed that the future belongs to the aeroplane. At the present moment, it must be admitted, it is not sufficiently perfected to be fit for adoption as a regular instrument of war. Above all the construction of a suitable motor is imperative. The motor must be sufficiently light, whilst also being able to run with certainty for several hours, and it must be capable of endowing the aeroplane with a high speed, which will, of course, increase its carrying power.

The aeroplane must be able to raise itself in the air, starting from any point. A greater measure of stability, and, if possible, automatic stability is equally desirable, all the more so in that it would not only guarantee security in flight, but would also make learning to fly easier and shorten the period of tutelage.

An aeroplane which is to be used for military purposes must be able to carry a light load, and the dismantling and the erection of the machine must occupy but a short space of time.

Supposing that all these perfections can be applied to aeroplanes, one of the greatest advantages of these engines of war over dirigible

balloons will be that at a distance of about 3 miles they are scarcely visible.

Those who saw the flights of Drexel, Morane, Grahame White and Jones from Bournemouth to the Needles this summer can testify that it was difficult to discover the aeroplane even by means of the telescope when it could not have been more than 3 miles distant, and at 2 miles it was practically invisible to the naked eye unless the direction were actually known.

An aviator who succeeded in approaching within 2 miles of the object to be observed without being perceived himself, would see much without running any risk. This is one of the most valuable qualities of the aeroplane from the military point of view.

Up to the present the observations made by means of the aeroplane must be reported by the aviator himself. It follows that it will not be used in the manner of the dirigible balloon for flights of long duration over large areas, but rather to make relatively short dashes, unless by reason of improvements introduced in the motor it may be possible to provide the aeroplane with a wireless telegraphic installation. This is said not to be impracticable, for every time that the power of the motor is increased by one horse-power the carrying power of the apparatus is increased by about 40 lbs.

The sphere of military utility of flying machines varies with the state of the atmosphere, the length of time the motor will run, and the proper speed of the machine.

With regard to atmospheric conditions the aeroplane is better situated than the dirigible balloon, since the resistance which it normally encounters is much smaller.

A contrary wind of 22′ per second (15 miles per hour) facilitates the start as well as the landing.

In October, 1909, at Blackpool, Latham made a flight of about 30 miles in a wind of 53′ per second (about 36 miles per hour).

It has been reported that at the Wright's flying school in America flights are made by the pupils in winds of over 40 miles per hour.

The length of time that the motor will run vitally affects the machine. The greatest time for which a present-day aeroplane can be relied upon to fly is six hours. The speed attainable at present is about 60 miles per hour. It does not seem impossible that a velocity of 90 miles per hour may be reached before very long.

If the present-day maximum achievements of aeroplanes can be considered as *normal* achievements, there is reason to be satisfied from a military point of view. For with a velocity of 45 miles per hour (66′ per second) and a length of run of 4½ hours, an aeroplane could carry out a journey of about 200 miles. It would then have a radius of action of 100 miles.

From these figures it is seen that aeroplanes will be above all practicable machines for relatively short reconnaissance flights, on condition that an observer is carried besides the driver.

In siege warfare, in the attack of strong places and of fortified points, aeroplanes might already in their present state of development render much service.

For field or mobile warfare it will doubtless be necessary to await the improvements detailed above before they can be considered to be practical instruments of war.

The valuable quality of the aeroplane of allowing observations to be made without being itself perceived, predestines it for the service of reconnaissance, since it can approach without risk within 2½ miles of the object to be observed, and even closer by running risks which are relatively small. During this time the aeroplane must remain constantly in rapid motion, and in order that the utmost use may be made of it as an instrument of war, observations of comparatively minute details must be effected at a distance of 2 miles.

During the advance, by means of repeated flights, reports can be furnished within a few hours if during the course of the day contact is gained with the enemy.

These reports can supply valuable data on which the measures to be taken for reconnaissance and for protection can be based. Information received by the Commander-in-Chief from other sources can be checked by special aerial rapid reconnaissances or dashes, which considering the enormous speed of aeroplanes would not require much time for execution.

When water is encountered across the line of advance the dirigible aerostat can render the most signal services; in front of a line of water which it is difficult to cross, every other means of reconnaissance would be temporarily useless.

In the battle itself aeroplanes can approach closer to the enemy's lines than dirigible balloons and so can render greater service, and both types would obviously be specially useful to look out for turning movements against the flanks, the aeroplane's special *rôle* being to make repeated sudden reconnaissance dashes.

It is interesting to consider the altitude which an aeroplane must be able to reach in order to be useful for military purposes.

2,500 to 3,000′ has been laid down as the minimum height. It is only at this altitude that the aeroplane is safe from the musketry fire of the enemy.

This height is sufficient when the machine is vertically over a party of riflemen. If it does not approach closer than within 1½ miles of riflemen it will be scarcely visible and will be still less likely to serve as a target for effective fire.

If we do not take the question of vulnerability into consideration,

the aeroplane must be able to cross all the objects to be met with on the terrain to be traversed, such as houses, woods, etc., as well as elevations in the ground.

For this it is sufficient for it to maintain a height of from 1,500 to 3,000′.

Heights of over 9,000′ have been attained recently.

Just as the telephone and the telegraph therefore have never pretended to entirely supplant the primitive methods of ground reconnoitring and reporting, so the results obtained by aeronautics must only be considered as a very valuable new development of the means which the military commander utilizes in order to accomplish his most difficult task, viz. the direction of large armies.

A FIELD PRACTICE SUB-TARGET.

By CAPT. F. V. THOMPSON, R.E.

THE chief impression left on the mind by a useful and interesting course of instruction at the School of Musketry, Hythe, was the comparative ease with which men can be instructed in classification firing and the difficulties experienced in devising efficient instruction in collective firing, owing to the lack of field practice ranges in this country.

The necessity for this instruction is at once obvious when it is realized that on service, the men in the firing line seldom see the target they hope to hit. A prone khaki figure is invisible at 600 yards and often at 200 or 300 yards.

Consequently a high standard of training in controlled and directed fire is essential if any effective volume of fire is to be produced at a target invisible to the firers.

The necessary training may be subdivided as follows :—

Fire Unit Commanders	1. Detection of enemy. 2. Description of target (with reference to natural objects). 3. Estimation of range. 4. Control of fire.
Firers ...	5. Recognition of target. 6. Adjustment of sights. 7. Accuracy and rate of fire. 8. Fire discipline.

The 30 yards or miniature range and landscape target are at present the chief means utilized for the preliminary training. The conditions are necessarily artificial and restricted. Estimation of range is practised separately, which prevents the effect of faulty estimation being efficiently demonstrated.

With a view to making a nearer approach to service conditions and affording practice more closely resembling that obtainable on a field practice range, a simple form of sub-target has been devised which affords instruction in all the subheads mentioned above in such a way that the order of realism, compared with existing methods of instruction, is reversed.

For instance, on the 30 yards range the realistic portion of the practice is the actual firing of the rifle, the shock and noise of

discharge, whilst the artificial portion is the detection of enemy, description of target, estimation of range and recognition of target—a scenic target is used for the purpose.

With the Field Practice Sub-Target the order of realism is reversed. Fire can be directed and controlled over a large sector of actual country at any range (which must be correctly estimated). Fatigue men firing blank can be used for practising detection. On the other hand there is no actual firing of the rifle and the record of hits is on the sub-target.

This order of realism would seem to be more logical as men would not be exercised in field firing until thoroughly trained in classification work and would be well acquainted with the shock of discharge, etc., whilst their lack of experience would be chiefly in collective fire at a natural target.

There are obviously increased facilities in the training of fire unit commanders.

The Field Practice Sub-Target will afford some of the advantages of a field practice range at little or no cost in the matter of ground, but it is hardly necessary to point out that no makeshifts such as 30-yard ranges, miniature ranges, landscape targets and sub-targets however cheap or efficient can be advocated as substitutes for field practice ranges so long as there is land available in this country and money to buy it. They may however form useful aids to instruction in preparing men for field firing and tend to economy in time and ammunition. In cases where field firing has to be carried out on a classification range the Field Practice Sub-Target should help to supplement the training.

There are several forms of sub-target on the market but so far as is known all are confined to classification firing under conditions which are entirely artificial.

Although not essential, it was decided, in order to simplify construction and lessen cost, to pivot the rifle by a ball and socket joint.

A number of experiments were made to determine the "point of least constraint."

This point is found to be 3″ in advance of and 3″ below the toe of the butt when the rifle is in a horizontal position. The feeling of constraint to a firer in the prone position, when the rifle is fixed to an upright standard by a good ball and socket joint at this point is almost inappreciable, provided the height is adjusted to the individual. Lowering or raising the rifle 1″ from the normal position is found to be sufficient compensation for difference in build of firers and is most conveniently effected by having two mats each 1″ thick which can be placed under the firer's elbows as required. A more efficient but more cumbersome method is to place the firer on a 6′ wood platform which can be raised at its front edge as required.

A joint at the point mentioned allows the reproduction on the sub-target of the common errors such as "bobbing," flinching, pulling at the trigger, and inclination of sights (except at short range).

For elementary instruction the joint would be an objection and a free rifle preferable, but as only trained shots would use the sub-target there appears to be no objection to a "tied rifle" provided the results of firing correspond to field firing results and the firer's position and "feel" of the rifle are normal.

The results of firing at prone figures at ranges from 500 to 2,000 yards have been tested and found to agree approximately in percentage of hits with actual field firing results. A prolonged series of tests would be necessary to finally settle this point.

Firers are so far agreed that their position and "feel" of the rifle are normal and that they are in no way "baulked" by the joint when the elbow rest is properly adjusted.

The following is a brief description of the device :—

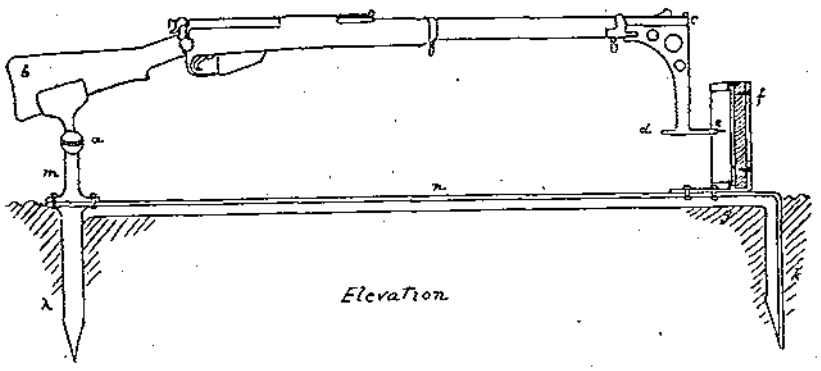


FIG. 1.

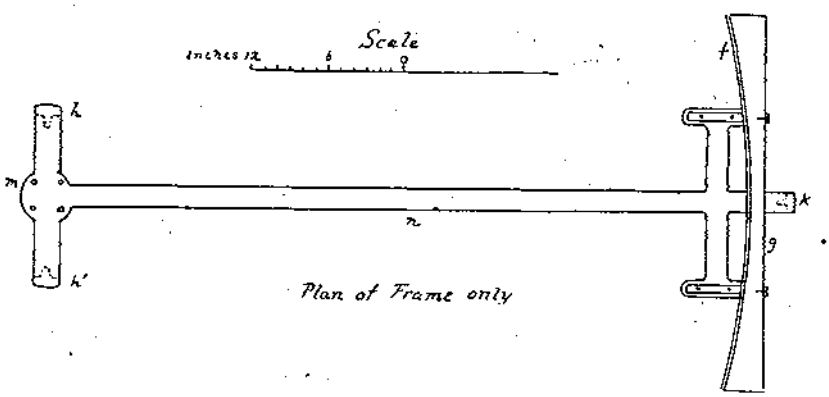


FIG. 2.

a is a ball and socket joint, the ball being attached to the butt fitting at *b*, the socket with a screw collar being carried on a short upright standard *m*. *m* is detachable from the gridiron frame *hh'k* which has three prongs *hh'k*.

cd is a light metal attachment at the muzzle carrying a needle *de* which slides in such a way that its line of travel produced passes through the centre of *a*, is parallel to the axis of the bore, and 8" distant from it.

A light rod, passing down the bore, in contact at one end with the striker and at the other end with a lever at *c* pivoted above *c*, gives the needle *de* a travel of $\frac{1}{2}$" forward and back when the trigger is pressed.

fg is the sub-target, consisting of a metal sheet 8" × 24" bent to a curve of radius $ae + \frac{1}{4}$". It is backed with wood and is provided with clips to retain two sheets of thin cardboard.

The sub-target *fg* is carried on the gridiron frame *hnk* which is held fast in the ground by three metal prongs *hh'k*.

The cardboard is punctured by the needle each time the trigger is pressed.

METHOD OF PREPARING F.P.S-T.

(1). Peg down the apparatus on a suitable piece of ground from which a good view of country is obtainable. The frame must be driven in flush with the ground by means of a sledge hammer.

(2). Obtain a 6" map of the country or a mekometer or other range-finder.

Take ranges to any number of objects in positions likely to afford cover.

(3). Set sights and take careful aim at each object in turn, pressing trigger and obtaining a puncture for each object. Carefully mark these and number them consecutively with a pencil making a rough sketch of each object if necessary, to avoid mistakes, and write the range against each.

(4). Remove the card and using it as a register, prick through any number of sheets required, being careful to see that the edges are flush.

(5). At each point on the card stick down a row of head and shoulder figures. These are lithographed on narrow strips of gummed paper and are of 10 different sizes for ranges from 500 to 2,000 yards. See *Fig.* 3.

They are to scale and represent prone figures extended.

(6). If rights are acquired over the ground, corresponding head and shoulder dummies may be spaced at 3 paces interval and fatigue men with blank may be posted at the various ranges.

If no rights have been acquired dummies cannot be used. This makes little difference, as the firers in any case could not see them, and they could only be seen by fire unit commanders when using telescopes or high power field glasses.

(7). Allowance for "error of the day" should be made by the instructor when adjusting sights for the trial shots.

Allowance for wind should be made when gumming down the paper strips.

The cards should be prepared before the firers and fire commanders arrive on the ground.

To obtain full value from the instruction there should be six or more of the sub-targets pegged down in a row—several could be carried on one frame on level ground.

Method of Instruction.

1. Insert prepared cards in the sub-targets and when fixed, slide in an extra blank sheet to prevent firer seeing result of his fire.

2. Adjust elbow mats to suit firers.

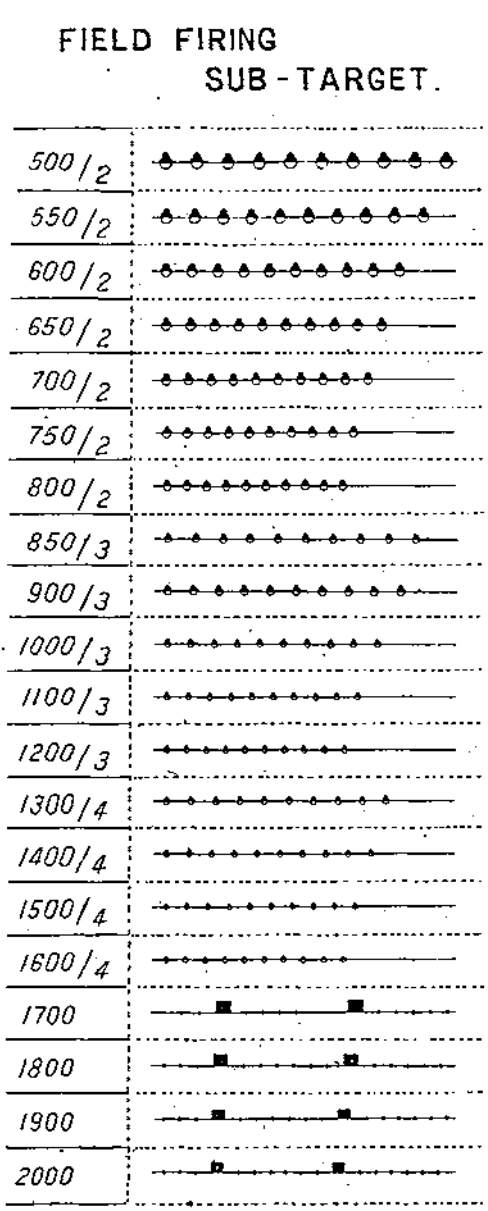
3. Take fire commander to one side and point out one or more targets explaining the number of enemy and their extension.

4. Give (*a*) a time limit in which to describe target and to use rapid fire with an unlimited supply of ammunition.

Or (*b*) a limited number of rounds per man to be expended at discretion.

Other conditions will suggest themselves—such as dispersion, concentration of fire, etc.

5. If desirable give fire commander an observation of his fire by examining



The figure following the range shows the number of paces extension. The targets represent prone figures to scale. A hit in the clear portion of the circle would probably give an effective ricochet. The black rectangles represent the front of a column of fours. The small dots show 10 feet.

Fig. 3.

the sub-targets at intervals. This is done by withdrawing the blank sheet.

6. On conclusion of practice remove cards and check results in presence of firers and fire commander, pointing out faults and making deductions.

7. A higher test in fire control can be obtained as follows :—

A company with blank ammunition may be extended to represent the firing line and one man in each section or squad provided with a F.P. Sub-Target. By changing round at intervals, it should be possible to obtain a fair idea of the fire control and its effect.

ACCURACY LIMITATIONS AND COST.

The accuracy of the apparatus is found to be such that a hit or miss can be recorded at 2,000 yards on a prone figure and at 600 yards the portion of a figure hit can be determined provided the gridiron frame is rigid.

In flat country the rows of figures at successive ranges do not foul one another since owing to the increase in elevation for the more distant range, the vertical intervals are much exaggerated.

One limitation is the inability to use blank or dummies but special dummies could be made.

There is a limit to elevation and depression amounting to 10° in a vertical plane.

The lateral limit is approximately 30° with a 24" sub-target—this can be increased by an alteration in design.

The experimental apparatus has been made for the long rifle, but by a supplementary fitting on the muzzle could be made to fit the short rifle.

If made in large quantities the cost should not exceed £5 per sub-target. Small numbers would cost considerably more. The cost of experimenting and making the experimental model was approximately £30.

GIBRALTAR UNDER MOOR, SPANIARD, AND BRITON.

(*Continued*).

By Col. E. R. Kenyon, R.E.

In 1790–1 the Artillery were commanded by Lieut.-Colonel (afterwards General Sir A. F.) Farrington, whose name was subsequently given to a battery constructed in 1877–9 and now obsolete.

About this time the name of "Cornwall Parade" came into use instead of "The Green Market" for the open space in front of the block of military buildings now used by the Royal Engineer officers as their Mess and quarters. In a Garrison Order of January 20th, 1780, the name "Greenmarket" is used, but in an Order of 14th February, 1791, the artificers are directed to assemble on "The Cornwall Parade" for inspection by the Commanding Engineer. On November 10th, 1783, the 32nd, or "Cornwall" Regiment had disembarked at Gibraltar and on 24th April, 1787, a Garrison Order directed them to move into quarters in the town and they did not leave the station until some years later. The regiment is now known as "The Duke of Cornwall's Light Infantry"; and there is a peculiar appropriateness in their name being specially commemorated in Gibraltar, because it is one of the three survivors of the six regiments of Marines raised in 1702 for the War of the Spanish Succession. As "Fox's," afterwards "Borr's," Marines it was with Rooke at the capture of Gibraltar and formed part of the garrison in the subsequent defence. The other two surviving regiments are the 30th (which was also at the capture but not the defence) and the 31st.* The Greenmarket was never large enough for a regimental parade, but there was an open space on the east side of what is now Governor Street, between it and the "Blue Barracks"—(now the Civil Hospital)—and a note exists in the R.E. Office† that a house at the north-east end of this street was taken to enlarge the parade of the 32nd Regiment, so that it is probable that these two spaces together furnished the regimental parade ground, while the colonel and other officers were no doubt in the present R.E. Mess and quarters.

From 1787 to 1791 Major-General O'Hara was Commandant, during which time‡ the Lines were strengthened, and the Queen's Gate and

* Records and Badges of the British Army.
† MS. List of "Officers' Barracks," 1789.
‡ Drinkwater, p. 27.

Road were made under the supervision of Capt. Haynes* who was the Garrison Quartermaster and after whom "Haynes' Cave" was probably named. O'Hara's name was long preserved by a well-known tower on the top of the Rock called "O'Hara's Folly," which Rees says was begun by him under the name of "St. George's Tower" with the intention of raising it to such a height as to enable movements in the harbour of Cadiz to be observed. The British Government, however, disapproved, condemned it to be left unfinished, and (according to Navarette) made General O'Hara pay the expenses out of his own pocket.† The unfinished tower was demolished some years ago; and now the name of O'Hara is perpetuated in a more dignified, if less conspicuous, manner by O'Hara's Battery. General O'Hara returned to Gibraltar as Governor in 1795 and held the appointment until his death in 1802 when he was buried in the King's Chapel where there is a tablet to his memory.

During his Governorship Gibraltar witnessed two naval fights between the British squadron under Admiral Sir James (afterwards Lord) De Saumarez and the French and Spanish Allies. The first took place on July 6th, 1801, off Algeciras the guns of the Spanish forts being able to take a very active part in the battle which resulted in the loss of one British ship, the *Hannibal*, and much damage to the others. The "Trafalgar Cemetery" outside Southport contains a memorial to the Master of the *Cæsar* who fell in this action. Saumarez retired to refit at the Gibraltar Dockyard and on the 12th sailed out again to attack the Allies who were making for Cadiz. The action commenced off Carnero Point (at the south-west of Gibraltar Bay) about 11 o'clock on a dark and stormy night, and ended in a brilliant victory for De Saumarez although the enemy had been reinforced to about twice his strength. Nelson said "A greater action was never fought."‡ The thanks of both Houses of Parliament and a pension were voted to the Admiral, on whom the Order of the Bath was also bestowed the investiture being carried out by General O'Hara on behalf of the King at a great Ceremonial Parade on 16th November, 1801.

The discipline of the garrison during O'Hara's time seems to have been extraordinarily bad; for the next Governor, who was the Duke of Kent, the father of Queen Victoria, was "sent to Gibraltar to restore order in a mutinous garrison."§ The Prime Minister, Mr. Addington, alluding to the drunkenness and insubordination then prevalent there said to him "This state of things cannot be permitted to endure. It has lasted already too long. It must be put down, and Your Royal Highness is the man to do it. You may

* Garrison Orders, March 20th, 1788.
† Rees' *New Cyclopædia*, Vol. XVI., and *Las Llaves del Estrechs.*
‡ *Encyclopædia Britannica.*
§ "Queen Victoria's Letters," 1907.

firmly reckon on the fullest measure of support from the Cabinet at home."* He landed on 10th May, 1802, and with very little delay addressed himself to his task. Hitherto the Governors had received the proceeds of the licenses of the wine houses of which there were at least 90, producing a revenue for General O'Hara of some £7,000 per annum. The Duke cut these down to 60 and afterwards to 40; and at the same time took steps to secure a supply of wholesome beer for the troops by starting a brewery at Europa, the memory of which is still preserved by the "Brewery Barracks" part of which stand over the ancient "Nuns' Well" or "Moorish Bath" on a plot of ground which is shown by a plan in the Royal Engineer Office to have been granted to Mr. Ninian Douglas on 9th July, 1802; no doubt for the purpose of building the Brewery which is referred to in Garrison Orders of April 14th, 1803, as "lately established." In that order it is announced that H.R.H. had licensed, for the sale of malt liquor only, three houses, namely, "The Three Light Infantrymen" in Cooperage Lane, "The Three Guns" in Cannon Lane, and the "Halfway House" between Southport and South Barracks, which was to be known as "The Three Grenadiers." Strangely enough it was in one of these very houses—"The Three Guns"—that a mutiny was hatched a few months later which led to his recall on the ground that he had exercised undue severity in suppressing it. The mutiny broke out on December 24th, was suppressed, but broke out again on the night of the 26th. It was again suppressed; and three men were shot for their share in it on 2nd January, 1803, on the Red Sands (now the Alameda) in the presence of a general parade of the garrison. On the day of the execution the Duke issued a Garrison Order in which he attributed the whole affair to drunkenness, but statements by mutineers or their comrades are published in *The Life of the Duke of Kent* detailing an elaborate plot to seize him and force him on board ship for England. The gratitude of the civilian residents for the better order introduced by him into the garrison is very clearly shown by their formal addresses and by their subscription of a thousand guineas after his departure for the purchase of a piece of presentation plate and a diamond "Garter." His active career was closed by his recall to England for which he embarked on May 1st. On his arrival he immediately demanded full investigation of his conduct which however, was never granted, though he was afterwards promoted to Field Marshal and retained his post of Governor until his death in 1820, but without being allowed to return to Gibraltar. His name is rendered familiar to every member of the "Royal Calpe Hunt" by a farm to which he often went and which is a favourite meet of the hounds,—"The Duke of Kent's Farm" on the outskirts of the

* *Life of the Duke of Kent*, by Neale, 1850.

Cork Woods. An earlier tour of service which he had performed in Gibraltar in 1790–1, when he was appointed to the command of "The Queen's Royal Regiment," is commemorated by "Prince Edward's Gate" which was opened through Charles V.'s Wall in 1790* and "Prince Edward's Road." Very shortly before his departure, namely on March 30th, 1803, a Garrison Order was issued giving the name of "Gunner's Parade" to the open space in front of the Artillery Headquarter Offices instead of "Governor's Parade" by which name it had previously been known; but the order became a dead letter and the name of "Governor's Parade" is still the official designation of that place although the other name is also often used. Fronting it on the eastern side is the Garrison Library, which owes its commencement to Colonel Drinkwater, the historian of the siege. He founded it in 1793; and it grew so rapidly that Mr. Pitt's government consented to provide funds for the erection of a suitable building which was commenced in 1800 on a site shown on the 1745 plan as "commonly called the Governor's Garden," and in 1753 as "Inhabitants Garden." In 1804 the main portion was completed and in 1867 another wing was added. Attempts to form a museum in connection with it have been made but most of the articles collected have unfortunately been allowed to be dispersed, while the societies formed for scientific research and discussion have, after a more or less precarious existence, faded away, leaving little trace except some records enshrined in a minute book preserved in the Mess of the officers of the Royal Engineers.† A small collection of geological specimens has recently been arranged in the Library.

The Brewery founded by the Duke did not long survive his departure, and in Garrison Orders of 14th January, 1805, we read "The detachment of the Queen's, 13th and 54th Regiments now at Europa and Windmill Hill will occupy Douglas's Brewery at 4 o'clock this afternoon," so that the Brewery was converted into "Brewery Barracks" within 2½ years from the granting of the site to Mr. Douglas.

From September to December, 1804, a virulent fever raged in Gibraltar which carried off nearly 6,000 persons out of a population of 15,000. There is little doubt that it was the West Indian yellow fever; and it is now known that one of the Gibraltar mosquitoes is identical with that which carries the germs of that fever, a fact which accounts for its rapid dissemination when once introduced. One result of this epidemic was the building by the British Government in 1805 of the "Governor's Cottage" at Europa as a summer residence for the General Commanding the Garrison, its first occupant being General Fox who was appointed Lieutenant-Governor in 1804 in

* Garrison Orders, September 24th, 1790.

† This book has now been handed over to the Garrison Library.

succession to General Trigge who had taken over the command from the Duke of Kent in 1803. A curious and interesting occurrence in connection with this fever was a conference which took place in October, 1805, on the Neutral Ground between the British medical officers who had been fighting the epidemic and a party of French doctors who had been travelling in Spain for the purpose of investigating the outbreaks of a malignant fever which had occurred in various parts of that country. The interview was arranged at the request of General Castaños, commanding the Spanish forces, although England was then at war with France and Spain; and the meeting actually took place a few days before the Battle of Trafalgar.*

Outside the Southport is the little Trafalgar Cemetery which by its name reminds us that after that battle the British fleet put into Gibraltar,† some of those who died from their wounds being buried there. It is however a mistake to suppose that its use as a cemetery dates from that time. It was consecrated in June, 1798.‡ The earliest legible inscription is to the memory of Capt. John Knipe of the 90th Regiment who died in 1798; and there are many memorials to persons who died during the fever of 1804.

The figurehead of the Spanish line-of-battle ship *San Juan*, captured at Trafalgar used to be in the Alameda but has long ago disappeared.§

A quaint incident illustrative of the amenities of war is recorded in the *Gibraltar Chronicle* of June 1st, 1805, where there appears an indignant account—(called forth by the publication of the French version of the same episode)—of a raid which was made in March on our line of advanced posts, and which resulted in a subaltern and four soldiers being carried off from the Devil's Tower guard. The *Chronicle* characterizes the attack as "a step so unusual amongst civilized nations, even during a war, as attacking advanced sentries by a large body of Banditti and Felons armed with pikes and daggers without having any further object in view," and states that General Castaños—who was then in command of the Spanish forces—"in the most

* *Gibraltar Chronicle*, October 12th, 1805.

† *Chronicle*, November 2nd, 1805.

‡ This is proved by the following facts:—Vol. XI. of the Garrison Orders is an index and contains the following entry: "June 4th, 1798. The new Burial Ground to be consecrated." The actual Orders of 1798 seem to have been destroyed, but in 1799 Orders are recorded on 24th August and 16th November for the funerals of Capt. Tuffie, of the 44th Regiment and Lieut. Montresor of the 18th in "The New Burial Ground." These two officers are buried in graves Nos. 43 and 2 respectively of the "Trafalgar Cemetery" as recorded in the Royal Engineer Office.

§ *Travellers' Handbook* which describes it as "a statue harpooning a fish." A gardener who has been there 31 years (1910) had heard of it but never seen it.

unequivocal terms expressed his abhorrence of a transaction which every Spanish officer and gentleman must contemplate with indignation, and remanded the officer and men who had been thus kidnapped by the Convicts, declaring that he could not consider them as prisoners of war." In another sentence the *Chronicle* describes the raiders as "Galley slaves," and even from the French account it would seem that there was something peculiar about the affair as it describes the 180 men who made the attack as armed with hatchets and other weapons.

The changeful politics of Europe under the Napoleonic *régime* now brought about a complete revolution in the mutual relations of Great Britain and Spain. In 1808 Napoleon forced his brother Joseph on to the Spanish throne; the nation rose in arms against this usurpation; England, which was already in alliance with Portugal, aided Spain; and the Peninsula campaigns were fought out. The present ruinous condition of the old masonry works on the Spanish frontier line is a curious reminder of the changed relations thus introduced. In 1727 the Spaniards erected a fort at Punta Mala* and a strong line of bastioned fortifications across the isthmus, commencing with Fort San Felipe on the west and terminating with Fort Santa Barbara on the east; but in 1810 when the French were overrunning Andalusia General Castaños, fearing that they would seize these works and so get an aditional grip on the country asked the British Commandant to destroy them. He had already in 1809 obtained the assistance of the British artillery to remove the guns, etc., from his Lines and to ship them to Valencia and Catalonia.† Accordingly a detachment of the Military Artificers under Capt. G. J. Harding, R.E. (afterwards Sir George Harding, K.C.B.), covered by from 500 to 800 other troops was sent out from Gibraltar to blow up the whole of the Lines on the frontier, a duty which occupied some months.‡ Some of the materials were used in fortifications and buildings in Gibraltar§ as, for instance, in the buildings behind the fountain on Governor's Parade. They also destroyed all the works and barracks round the bay, including the batteries of Punta Mala, Torre del Mirador (close to the River Guadaranque), and Cabrita Point. In this they were assisted by a Portuguese squadron on January 10th, 1810, without interference from the French although they were on that same day at both Tarifa and Algeciras. On February 25th a sharp skirmish took place between a Spanish cavalry detachment from the fortress and a French party which had come down from San Roque into Campamento. The Spaniards drove them off and returned to

* Montero, p. 340.
† *Gibraltar Chronicle*, 28th January, 1809.
‡ Conolly's *History of the Royal Sappers and Miners.*
§ Montero, p. 308.

Gibraltar where a Sardinian officer who had fallen in the fight was buried.* Harding was again in Gibraltar in 1844† when he was in command of the Royal Engineers as Colonel; and his name is attached to a battery (now obsolete) constructed in 1876–8 at Europa. While the French were occupying San Roque its unfortunate inhabitants (whose ancestors had fled thither from Gibraltar in 1704) took refuge at Catalan Bay where some of them were killed in December, 1811, by the fall of a great boulder which killed 18 persons and wounded others.‡

Another instance of help given by Gibraltar to Spain was afforded in 1812 when four men of the Royal Military Artificers and an Engineer officer were employed on Verde Island off Algeciras in repairing its defences.§ During this same period (1808–12) the naval establishments were increased by the addition of the Victualling Yard at Rosia.‖ In 1813 a village was commenced on the Neutral Ground which was subsequently developed by Sir George Don into a suburb of about 100 wooden huts which were only occupied from the 1st June to the 1st December, but now form the permanent hutment on the North Front.¶

In connection with these events of the Peninsula War allusion may here be made to Jones' Battery which although it was not constructed until a much later date preserves the name of an officer of R.E., Sir J. Jones, who was greatly distinguished in that war and who is the classic historian of its sieges. In 1841 he recommended the construction of a 10-gun battery on the site of the Chief Engineer's garden. In 1859 a report on the defences of Gibraltar was furnished by Colonels Lefroy and Owen of the R.A. and R.E. who point out with some indignation that although "Jones' Battery" has been built it is on a higher site than that selected by its distinguished godfather; and state their hopes that this change of site was due to no personal motives. They evidently thought that some former Engineer officer had not been proof against the temptation to sacrifice the public interest to the preservation of his garden. Fortunately, however, it appears that Colonel Harding, R.E., who recommended the change of site and obtained the War Office authority for it, was supported by his colleague in command of the Artillery. To these two officers every succeeding commanding officer of Engineers owes a deep debt of gratitude; and the British public may rest assured that its interests have not suffered when they know that the battery,

* *Gibraltar Chronicle* of January 10th, February 14th, and 25th, 1810.
† *Travellers' Handbook.*
‡ *Gibraltar Chronicle* of December 10th, 1811.
§ Conolly.
‖ *Directory*, p. 35.
¶ Hennen, p. 72.

having long since gone the way of most fortifications in their turn, has been relegated to the obsolete class and now serves as a stable for the horses of some Artillery officers.

In October, 1814, General George Don arrived to assume the duties of Lieutenant-Governor; and to him are due many public improvements. In 1815 he promoted the scheme for laying out the "Red Sands" as an Alameda which was formerly opened for the use of the public in April, 1816. In the same year the Civil Hospital, which had been constructed out of the ruinous "Blue Barracks" which stood on the site of the ancient monastery and hospital of San Juan de Dios, was opened. The building was enlarged in 1880 and again in 1902. In September, 1889, it was converted by Ordinance from a civil hospital under private management into a Government institution under the title of "Colonial Hospital." In 1820 the Duke of Kent died and was succeeded as Governor by the second Earl of Chatham whose name was given to one of the Counterguard fortifications and is inscribed on the outer face of the Grand Casemates Gate. He retained the appointment until his death in 1835, and actually discharged the duties from 1821–26 when Sir G. Don was reappointed Lieutenant-Governor. The titles under which property is now held and the records of the Crown Lands Office date from 1821, the commission for the revision and settlement of titles having been appointed in 1817 and the settlement taking effect from 1821.

In 1828 a sanatorium for officers was built at Europa, but as it was found to be cheaper and more satisfactory to send invalids home the building stood empty and acquired the name of "Bleak House" which still attaches to it although it became the Officers' Mess when the adjoining hut-barracks were built. It is now occupied by the Royal Artillery.*

The foundation stone of "Holy Trinity Church" which is now the English Cathedral was laid in 1825 but the Church was not completed until 1832, in January of which year Sir George Don died and was buried in it. A tablet to his memory is in the Cathedral Library, and another, together with his bust is over the entrance to the Exchange which was opened in 1818.

Here it will be convenient to anticipate the exact chronological order of events in order to bring together the main facts in the history of the Cathedral.

The Cathedral Church of the Holy Trinity.

The building was commenced as above stated in 1825 but proceeded very slowly; probably because it was being executed by convict labour. On February 10th, 1831, a peremptory letter from Downing

* *Gibraltar Directory.*

Street called upon Sir George Don to report as to the measures he proposed to adopt "for finally securing to the Inhabitants and Garrison of Gibraltar the accommodation which they have so long required of a convenient and decent place of Worship; and which, it is quite clear, they would have enjoyed long ago, but for the negligence with which the operation of erecting this building has been conducted." On 24th October, 1832, the Principal Chaplain to the Forces reported that the Chaplain to the Forces at Gibraltar had notified to him the completion of "the New Church in that Garrison," and requested that arrangements should be made for its consecration.

On 15th June, 1833, orders were given from England for the "Government Chapel" (*i.e.*, King's Chapel) to be closed; and a wish was expressed that the "Chaplain to the Government of Gibraltar" and the "Military Chaplain" should find it convenient to perform service in the New Church alternately. The Governor had previously reported that half of the Church was "occupied by benches for the military and the other half by 71 pews containing about 348 seats or accommodation for as many of the Protestant inhabitants as will attend Divine Service."

On 12th August, 1833, a warrant was transmitted from the Archbishop of Canterbury authorizing the Government Chaplain (Mr. Hough) to consecrate the Church; but apparently this warrant was not acted on, for on 13th June, 1838, a fresh warrant (now in the custody of the Cathedral Trustees) was issued by the Archbishop authorizing Dr. Burrow, the Civil Chaplain, to carry out the consecration and recording that the Church was built "for the accommodation of a large proportion of the civil population and of the troops." Accordingly on the 17th October, 1838, the Church (which is described in Garrison Orders as "the Garrison Church" and in the *Gibraltar Chronicle* as "the Protestant Church") was consecrated by Dr. Burrow in the presence of Queen Adelaide and Prince George of Cambridge. On October 15th, 1842, the *Gibraltar Chronicle* published an extract from the *London Gazette* of 30th September announcing that the Queen has constituted Holy Trinity Church a Cathedral Church and Bishop's See, and has ordained that the whole town of Gibraltar shall henceforth be a City and be called the City of Gibraltar, and has constituted "the said City and all the territory comprised within Her Majesty's possession of Gibraltar and its dependencies to be a distinct diocese and to be called the Diocese of Gibraltar." The *Gazette* proceeds to appoint the Rev. G. Tomlinson, D.D., to be consecrated as Bishop of the said See with jurisdiction within the churches, chapels, and places, set apart for Church of England services in Malta and its dependencies.

The letters patent of 30th September, 1842, were however revoked

by a proclamation which is published in the *Gibraltar Chronicle* of December 16th, 1873, the see being then vacant. Since that date there have been only two Bishops, namely the present Diocesan, Dr. Collins (consecrated in 1904), and Rev. Charles Sandford who was consecrated on 1st February, 1874, an account of the ceremony appearing in the *Chronicle* of February 9th. These consecrations have taken place under the authority of a licence issued by the Crown to the Archbishop of Canterbury. There are some 30 Bishops who are consecrated in the same way for certain missionary or colonial sees; this practice having been adopted since the decision of the Privy Council in the case of the Bishop of Natal (1865) threw doubts on the validity of many of the letters patent.

In 1869 Lord Granville, as Secretary of State for the Colonies, decided to hand over the Churches and Chapels of Gibraltar to the different Communions. Lord Kimberley in 1872 stated that this was subject to the right of the Crown to resume possession in case of military necessity; and in 1902 Mr. Chamberlain agreed that this reservation of Crown rights need only relate to time of war, so that now the Church, though used with the consent of the trustees for parade services during the summer months (on payment of a small sum by the War Office) is no longer the garrison church but is purely the Cathedral of the diocese and the parish church of the English community, whether civil or military.

The King's Chapel as Garrison Church.

As we have seen above this Chapel was closed by order of the home government in June, 1833, the Church of the Holy Trinity having been completed in the previous year for the use of the troops and a large proportion of the civil community. In 1842 Sir R. Wilson assumed office as Governor; and in an official letter dated 8th March, 1844, the Assistant Military Secretary says: "When the Governor assumed this government, he found the Convent Chapel in a neglected, dark, unwholesome, abandoned state, and a Sepulchral nuisance to the Residence."*

On 31st August, 1843, an expenditure from civil funds was authorized for "fitting up the Convent Chapel for the use of the Troops so as to afford an increase of room to the civil population of Gibraltar" in the Cathedral; and the Garrison Orders of 1st March, 1844, speak of "the King's Chapel having lately been appropriated exclusively for the use of the Troops."

The letter of March, 1844, proceeds to state that "There was no record of any intention to restore the Chapel for the Garrison's use, the requisite accommodation being provided in the Cathedral, but the

* Official Letter-book at Government House.

Bishop and Archdeacon stated to the Governor that the Protestant community at large experienced great inconvenience from the Cathedral being so filled by the Military that insufficient place was left for the Civil congregation. The Governor therefore applied for, and obtained, permission to restore the Chapel as an *auxiliary*, or Chapel of ease, to the Cathedral, and not as *heretofore* as the *sole* place of worship for the Garrison."* The restoration was carried out in 1843 at an expense of about £240, with an additional expenditure of £63 on furniture. The Secretary of State's despatches show that the Convent Chapel was to ease the Cathedral, not by being thrown open to the whole community, but by being adapted "to the accommodation of the troops." The troops continued to use the Cathedral also, free seats for 60 persons and 1 Staff Officer being assigned to them.

Gradually, as the Garrison was reduced and as other chapels were provided in the South District, the King's Chapel became what it is now, namely the sole Garrison Church for the North District.

We must now resume the interrupted summary of the general history of the Rock. In 1838 the foundation stone of the lighthouse at Europa was laid by Sir Alexander Woodford who had succeeded Sir George Don as Lieutenant-Governor in 1835 and had become Governor in 1836. His name is given to one of the now obsolete batteries at Europa. He was the last of the Lieutenant-Governors, that office being definitely abolished in 1839. The light was first shown in the lighthouse in 1841.

That the never-ceasing process of keeping Gibraltar's fortifications up to date did not cease in Queen Victoria's reign is testified to by "Prince Albert's Front" (1842), "Eliott's Battery" (1845), "Wellington's Front" (1846), and the extension of "Prince of Wales' Battery" which is commemorated by a memorial stone laid by King Edward VII. during a brief visit in 1859 which may be seen in the parapet, besides the Victoria Battery and others which need not be particularized.

During Queen Victoria's reign were built the Presbyterian Church of St. Andrew on Governor's Parade (1852), and the Roman Catholic College of St. Bernard for youths on Europa Main Road (1865). This college had been opened in 1858 in a building on the New Mole Parade from which it was transferred to the new site. Some years later, not being a financial success, it was closed and the buildings were utilized for the Loreto Convent and the "Little Sisters of the Poor,"

* This it had been in former days, but as it obviously could not accommodate the garrison, the troops used to parade for service in the open air on the "Grand Parade" now "Commercial Square."

and it was to the Chapel of this institution that the image of the Virgin from the ancient shrine of Europa was restored in 1866. St. Bernard, it may be mentioned has been the Patron Saint of Gibraltar since its capture by the Spaniards in 1462 on St. Bernard's Day: (August 20th).

The Wesleyans already possessed their Chapel, one having been built in 1810 on a leasehold site, the lease of which was extended in 1828 and ultimately was converted into a freehold.*

In 1875 the convict establishment which had been commenced in 1842 with a party of 200 convicts on board a hulk for the purpose of employing them on public works, was broken up. The convicts were transferred to England and the buildings, which were in the Dockyard, were taken over by the Admiralty. The rectangular block which projects from the Line Wall into the Dockyard a little south of Cumberland Flank is the relic of this establishment. Ten years later (March, 1885) a more interesting prisoner was consigned to Gibraltar, namely Zobeir Pasha, the great slave dealer of the Soudan, whose power for evil in that vast district was broken by General Gordon during his tenure of office as Governor-General of the Soudan (1877–80), and whose son Sulieman was executed under Gordon's orders by his lieutenant, Gessi, when he revolted. It was this same Zobeir whose great influence Gordon wished to utilize in carrying out the task entrusted to him in 1884 of evacuating the Soudan and sending down the Egyptian garrisons and civilians before the advancing Mahdi should overwhelm them. This is not the place to repeat the story of Gordon's efforts, of his gallant defence for ten months of Khartum, and of his death there on January 26th, 1885. The British Government felt that it was unsafe to allow Zobeir to reside in Egypt after these events and deported him to Gibraltar where he was interned in the Governor's Cottage until August, 1887, when he was allowed to return to Egypt, where he lived in Cairo until the death of the Khalifa, after which he was allowed to return to the Soudan where he occupies himself with agriculture and has made his estates an object lesson in improved methods.†

Until 1885 no civilians were allowed to be in the streets after midnight without permits, but in June of that year the Governor, Sir John Adye, removed this restriction.

In 1891 an indication was given of the increased use to be made of Gibraltar by the Navy. From 1816 until January, 1891, the Naval

* An interesting history of the Wesleyans in Gibraltar is given in the *Gibraltar Chronicle* of January 16th, 18th, and 19th, 1909.

† *Our Soudan: Its Pyramids and Progress*, by John Ward, p. 356. J. Murray, 1905.

Hospital had been lent to the military authorities, but a portion of it was now resumed for the Navy; and in 1904 the new Military Hospital on the Europa Main Road was taken into use, thus enabling the two establishments to be entirely separated.

In 1891 an event of some importance to the welfare of the town took place in the reorganization of the Sanitary Commissioners, a body which is charged with many of the duties of a municipal authority but which is in close relations to the executive authorities, both military and civil, there being on it a majority of official members selected by the Governor from the civil and military services with the addition of a naval member. Under this reorganized body an extensive scheme for an improved water supply was inaugurated. Only a portion of it has yet been carried out, consisting of a collecting area and fine reservoirs, but it is to be hoped that ultimately the whole project will be completed so that not only will there be ample storage based on modern ideas as to the necessary amount of water, but also that there may be a proper system of distribution by pipes, so as to eliminate the risks which are inseparable from the present system of distribution by water butts, casks, and buckets, and of storage in numerous private underground cisterns. The Colonial Government has transferred to the Commissioners its electric lighting undertaking, and the system has grown very considerably but financially it has not yet been an instance of successful trading by Government or other official bodies.

On March 17th, 1891, a most terrible disaster occurred in the bay, the *Utopia*, an emigrant ship, coming into collision with the ram of the battleship H.M.S. *Anson* and sinking within a few minutes. A heavy sea with driving wind and rain increased the difficulties of rescue work, and notwithstanding the prompt and gallant help given by all the men-of-war boats, including those of a Swedish ship, the *Freya*, 551 persons were drowned, of whom 130 were buried at the North Front.

In 1892 a great addition to the amenities of Gibraltar was given by the completion of the Algeciras-Bobadilla Railway, the first section of which had been opened in October, 1890.

In 1893 the construction of the modern harbour and its accompanying great extension of the Dockyard was commenced by extending the South Mole, which it will be remembered had its origin in the "New Mole" constructed in the reign of Philip IV. (1620) with a length of 300'. In 1851 it had been extended to a length of about a quarter of a mile.* The new harbour encloses a space of 440 acres of water and is equipped with a very fine dockyard.

* *Gibraltar Directory.*

The Caves.

Gibraltar, like all masses of limestone has many fissures and caves and it is said that in no place are they more numerous within a similar compass. They are of two kinds :—(1) Littoral or sea caves scooped out by the action of waves at sea level; and (2) Inland caves which are in fact magnified fissures in the rock. The sea caves are found at very different levels; some at the present sea level, as those in the cliffs north of the Governor's Cottage; Monkeys' Cave about 100′ higher up; Beefsteak Cave in the cliff above the south-east corner of Europa Flats; Genista Cave No. 4 which is nearly over the stables of Governor's Cottage, having its entrance in the face of the cliff about 40′ below the top; Martin's and Figtree Caves, about 600′ above sea level; some caves just above the top of the sand slopes of Catalan Bay; and Poco Roca Cave about 700′ above sea level; besides many others of less importance, but all marking, as these do, the position in ancient geological periods of the coast line at successive epochs. Of the inland caves the finest examples are the celebrated "St. Michael's" Cave; "Genista" Nos. 1, 2, and 3 in the Windmill Hill plateau; "Glen Rocky" Cave; and the great "Mediterranean" Cave discovered in August, 1902, in the course of the Admiralty quarrying operations, which is a most remarkably fine stalactite cave, containing stalactites and stalagmites of an infinite variety of form and size.

Careful geological examination of the four Genista Caves, Martin's, Figtree, St. Michael's, Poco Roca, and Glen Rocky were carried out by Capt. Brome (1863–68) who discovered the Genista group and the series opening out of St. Michael's to which he gave the name of "Leonora's." The name "Genista" was a play upon his own name, being the Latin for the plant "broom"; the Genista magazine therefore affording an abiding memorial of his work, although unfortunately it has absorbed the principal cave in his group of discoveries. The results of his work are narrated by Professor Busk;* and the most important facts are also summarized in a report by Dr. Falconer and Professor Busk to Sir William Codrington, the Governor of Gibraltar.† They say "The discoveries have not only yielded unexpected results regarding the former state and ancient animal population of the Rock itself, but they further point to a land connection between the southern part of the Iberian Peninsula and the African continent at no very remote geological period. . . . The fossil remains establish beyond question that the Rock was formerly either peopled by, or the occasional resort of, large quadrupeds like

* *Transactions of the International Congress of Prehistoric Archæology*, 1868.

† *Gibraltar Chronicle*, January 23rd, 1865.

the elephant, rhinoceros, aurochs, deer, ibex, wild horse, boar,* which were preyed upon by hyænas, leopards, African lynx, and serval. Several of these are of extinct species. They were not cave-dwellers, but their bones had been for the most part washed by the action of rain into the fissures and caves where they were found. There must have been abundant trees† and more or less constant green food. . . . Human remains were found in great abundance in the upper chambers. They appear to have belonged to between 30 and 40 individuals. They were accompanied by stone implements of the polished stone period, broken querns, a large quantity of pottery, marine shells of edible species, and other objects. . . . That the upper chambers of the cave were ever inhabited by savage man, we consider to be highly improbable. It seems more likely that they were used for the funeral rites of the dead." The writers urge most strongly the great necessity for establishing and maintaining a local museum in the interests of the world's science; but such an institution is still conspicuous by its absence, though its germ exists at the Library in the shape of some geological specimens and remains of bones found in the caves and recently arranged by Major Howell Jones, R.A. Many of these animal remains are from Collin's Cave behind Catalan Bay.

The excavations in Genista No. 1 extended to about 300′ measured horizontally in a S.W. direction from the prison wall and 290′ vertically below the Windmill Hill plateau, that is to a point about 80′ above sea level. In it were found the remains above described.

Martin's Cave was discovered in 1821 by a soldier whose name it bears, and is some 600′ above sea level. In it Brome found, partly under earth and partly under stalagmite two ancient swords very much broken and also a plaque of Limoges enamel under 18″ of stalagmite, all being of the end of the 12th or beginning of the 13th century; besides remains of human beings, animals, birds and reptiles, pottery, stone axes, flint knives, etc., similar to those in Genista. At Figtree, St. Michael's, and the other Genista Caves he found similar remains, but before he could complete his exploration of St. Michael's he was unfortunately stopped by a War Office Order forbidding the employment of the military prisoners on such work.

* So late as 1784 it would appear that there were wild boars on the Rock, for on November 22nd the following Garrison Order was issued:—"Information having been given to the Governor that two wild boars were lately shot on the Hill, it is his positive orders that no person whatever presume at their peril to shoot on the Hill in future."

† Ayala (p. 35) states, on the authority of the astronomer Euctemon, who flourished about 430 B.C., that "the forests which covered the Rock produced a religious fear in those who ascended it"; and Montero (p. 224) says that in 1525 A.D. the Sierra Carboneras was covered with serviceable trees for ship-building, which were used by Don Alvaro de Bazan, Governor of Gibraltar.

In Poco Roca he found a quantity of blown sand similar to that which forms the slope above Catalan Bay, giving rise to the belief that probably there are fissures communicating between this cave and the eastern face of the Rock. In 1789 this cave was prepared for the residence of the Governor, but was never so used.

The Genista skulls were found to be of the same character as the Basque skulls described by M. Broca in 1862 and 1868; and both have a very close analogy to those of the Kabyle tribes now inhabiting much of North Africa, leading Professor Busk to surmise that the primitive inhabitants of the Iberian Peninsula and those of North Africa may have been the same race.

A far more ancient skull now lies in the museum of the Royal College of Surgeons which has been stated by the Curator (Professor A. Keith) to be that of a woman who may have lived 200,000 years ago. The exact circumstances under which it was found have unfortunately not been recorded. The earliest mention of it which has been traced is the following note in the minute book of the "Gibraltar Scientific Society" (now in the custody of the Garrison Library) under date March 3rd, 1848:—"Presented a Human Skull from Forbes' Quarry, North Front, by the Secretary." That quarry is now disused and is south-east of the ancient Forbes' Barrier. In it is a small cave which is conjectured to have been the place where the skull was found. The secretary in 1848 was Lieut. Flint, R.A., who died at Mauritius as a Captain in January, 1857. The society's last record is under date May, 1853.

St. Michael's and Leonora's Caves.

In the Royal Engineer Office there are several records and sketch plans descriptive of explorations of St. Michael's Cave, which should be studied by anyone desirous of thoroughly examining it.

These explorations were solely directed to ascertaining the extent of the cave and to facilitating the safe passage of future investigators. The earliest of these records is a report by Capt. Webber-Smith, of the 48th Regiment, addressed to the Governor, Sir A. Woodford, in November, 1840, and describes minutely all the different passages which may be followed. All lead to a precipitous descent from the upper to a lower cave, at a distance of about 215′ from the entrance. This precipice can only be descended with the aid of ropes. There are five distinct passages over it, the falls being respectively (commencing from the northern side of the cave) 50, 40, 60, 80, and 150 feet in depth. In describing the approach to the one 150′ deep, Capt. Webber-Smith speaks of "many passages leading into one another" and says "I am inclined to believe that it is in these passages that Colonel Michell and his friend lost themselves some years ago. A little below where they join the main shaft, a branch leads away from

it, and there we found A.B. cut in the rock. The name of Colonel Michell's friend was Brett, and to this point they probably descended. Beyond this we found no trace of anyone." He proceeded about 170′ further and was then stopped by a small rock which blocked the narrow passage. Capt. Smith does not give the names of his companions. On August 29th, 1857, Lieut. Alfred G. Goodall, R.E., adds a memorandum that he found a small opening beneath this rock which gave him access to a series of small caves and passages. The furthest point to which he reached was about 180′ beyond the rock which stopped Smith. There he came to "a very soft sandstone in which the cave evidently terminates as it is of too friable a nature to admit of any opening remaining long in it. The air up to this point is still good." Several of the passages ended in small pools of water. There is yet another addendum by Lieut. Charles Warren, R.E. (afterwards Sir Charles Warren)—"In 1861 this last grotto was explored by a party for several days, and ultimately a small opening was found, not large enough for the entrance of the smallest child. Jumpers and chisels were brought down, and after hard work for two days the entrance was made large enough to admit a moderately developed man. A suite of small grottoes was then discovered; into which there is little doubt that man had never yet penetrated. In one of these was an extraordinary collection of stalactites which, on being struck with metal, emitted clear bell-like notes, which resounded throughout the caves with a wonderful effect." Accompanying this note is a plan copied by Warren "from a sketch by Lieut. Gamble, Royal Marines," which shows that this suite of grottoes did not carry them much further into the heart of the mountain. Smith's and Goodall's plans show their general direction to have been westwards, with a slight inclination to the south. Warren and Gamble place their furthest point in what they call the "bell grotto" as very near, but slightly north-east of Goodall's sandstone. On 10th March, 1879, Major Willoughby Verner, of the Rifle Brigade, explored the cave with Lieut. Carpenter, R.N., and a party of seamen from H.M.S. *Nassau*, and spent 4½ hours on the job. They assumed the depth of the top of the precipice to be 200′ feet below the entrance of the cave. From that point onwards they measured the depths (apparently by lines) and found the lowest point to be at a further depth of 420′, or a total of 620′ below the entrance. Their furthest point is recorded on a paper in a soda-water bottle "in the centre of the cavern in a small heap of stones." Other explorers had left records by names and dates scratched on the rocks and by soot from candles on the stalagmites and walls. There was water at the bottom and "a decided current of air in some places." They do not seem to have passed Goodall's and Warren's furthest points.

In Professor Busk's paper are quotations from Warren saying "The

bottom of the cave is 288′ below the entrance of the gate," and "I obtained the depth accurately both by measurement and with the aneroid barometer." Probably this refers to the bottom of the cave proper after descending the precipice but before entering the narrow passages and grottoes beyond. This would agree fairly with Verner's record which gives a depth of 270 to 350′ to that part, according to the place where it is taken.

Of course all the measurements must be subject to many inaccuracies, but the general result seems to be that it is possible to penetrate to a point about 565′ in an east-south-east direction, and about 620′ below the entrance, both measurements being taken from the mouth of the cave. This would place the lowest point at about 370′ above sea level.

Opening out of St. Michael's Cave on its northern side is a beautiful series of stalactite caves discovered by Capt. Brome and described in Professor Busk's paper, to which the name of "Leonora's Caves" has been given.

At one time it appears that an attempt (which happily failed) was made to change the name from St. Michael's to St. George's Cave, for the latter name occurs in "A Description of Gibraltar, with an Account of the Blockade, Siege, etc., etc.," 1782; and also in Dodd's *History of Gibraltar*, 1781.

(*To be continued*).

MAJOR-GENERAL SIR WILLIAM REID, R.E., G.C.M.G., K.C.B., F.R.S.

(Concluded).

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

After the death of Lady Reid, Sir William remained only a short time in Malta. His successor, Major-General Sir John Gaspard le Marchant, commanding the troops in Nova Scotia, was expected to arrive from Halifax towards the end of April and Reid only waited for his arrival to return to England. The *Malta Times* of the 27th April had an appreciative article on the retiring Governor, from which I make a few extracts to show the estimation in which he was held by the Maltese in the view of the leading organ of public opinion in the island :—

"We well remember the state of parties in Malta during the Governorship of Mr. Moore O'Ferrall. . . . The storm was at its height when Sir William Reid assumed the reins of government. Six years have elapsed and when—placed as we are in the present interregnum—we take a retrospective look, we see a contrast that can scarcely be more striking. In a few days Sir William will bid adieu to the shores of Malta. On arriving he was not fêted like his predecessor, nor was he at first carried to the clouds and afterwards abused as O'Ferrall was. Unlike him Sir William's ambition never was to become, and he never, in fact became, a reformer. He held the reins with a gentle hand, and his moderation was influential.

"Since the days of Sir Alexander Ball we veritably believe that the population was never more free from political agitation, was never more sober minded, nor was the natural propensity of our fellow subjects to grandiloquence and vociferation ever more generally exchanged for quiet and common sense, than at the present moment. . . . Whatever Sir William Reid's policy may have been it was new to Malta, and its effect was sedative. . . . If, as we believe, it was one of the results, to the attainment of which he set to work from the very beginning of his sway, to adapt this population, by habit of calm deportment and tranquil reflection, to the management of political institutions, his object has been crowned with success beyond all expectations. . . .

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"We are persuaded that all possess a latent consciousness that he has done good. A proof of this lies in the number of well-wishers and friends that he leaves behind him: and a still greater proof is to be

found in the absence of a single enemy or opponent. All acquiesce in the tacit conclusion that he is a just and upright man, endowed with a good will and a good heart, and influenced only in his resolves by a sense of duty and by a sense of justice. These are great virtues in any man, especially in a Governor; but they are virtues more felt than understood.

"The fact of a Governor throughout the whole of his administration being always accessible to all, high and low, always ready to hear, always inclined to examine wrongs and to give redress, who is only timid from fear of being less than just, constantly bent on this one dominant idea,—the fact of a public officer who, for six years, may be said to have never left his post, who has entered day after day into the minutest details of business, who has ever made it a point to consider the case of the meanest subject of Her Majesty entrusted to his care, with as much diligence as he would that of the highest personage, deserves prominent mention. Such virtues leave a deep and indelible trace behind them. . . . Malta may consider itself blessed if its future rulers, in lieu of more showy qualifications, are possessed with the deep love of justice and strict impartiality, which form the basis of the character of our departing Governor."

Sir William Reid reached England in the middle of May, 1858. He took a house in Gloucester Terrace, Hyde Park—No. 117. Writing to his daughter, Mrs. Gambier, soon after his arrival he tells her "It is a small house, but will do; I am tired of palaces." After making a round of visits to relations and friends, he wrote to the same daughter, on the 13th September from Gloucester Terrace, the last of the few letters from his pen that have been preserved. The following extracts from it, in view of the date at which the letter was written—only a few weeks before his death—have a pathetic interest:—

"I came up from Mr. Alcock's on Saturday, intending to go by sea to Scotland this morning, but I found that the steamers sail on Wednesday, so I have booked myself for Wednesday next.

"I parted from Charlotte and Grace (his unmarried daughters) at the Redhill Station, from whence they were to go to Chichester. I was pleased with Miss Nepean (afterwards Lady Fyers) and her sister, and also with Mr. and Mrs. Alcock.* They were very civil to us and want to be acquainted with you.

"To-day came an invitation to visit Mrs. Holland at Dumbleton, which I answered by saying we should be happy to go in October, should that suit them. . . .

"I suppose your sisters told you that I have bought the remainder of the lease of this little house. . . .

"Don't let me forget your beehive; I have been so much out of town that I have not been able to choose it yet. I don't know when I can

* See footnotes, p. 201, *R.E. Journal*, March, 1910.

come to see you all, but come I intend, if alive and well, some day again: and ere long if I can. . . .

"Did you see the fearful accident to the Duchess of Somerset last week? Going to-day to ask after her, she has made me promise to dine with her and a small party to-morrow, which I did not wish. . . ."

Sir William Reid's health had been far from good for some time. The death of his wife had told heavily upon him. But there had been nothing to cause his family to be alarmed, or even disquieted. In the following month, however, he was taken seriously ill with some internal trouble. His unmarried daughters were with him and nursed him tenderly. He arranged all his affairs and then he got worse. Paralysis was feared. One of the daughters attending on him, writing to her sister, Mrs. Gambier, said: "I feel very anxious lest the doctors should conclude it to be approaching paralysis, for though he would not suffer pain, how dreadful it would be to such a man." This was on Wednesday; on the Sunday following, which was the last day of October, 1858, he passed away at 6 o'clock in the morning. Happily he was saved from a fate which to "such a man" would have been, indeed, worse than death.

He was buried beside his wife at St. Leonards-on-Sea.

A fanciful but appropriate coincidence is mentioned by the *New York Tribune* in November, 1858, at the conclusion of a long and appreciative obituary notice of Sir William Reid. It is the occurrence during the last fatal illness of the author of *The Law of Storms* of a terrible hurricane in the West Indies and Bermuda.

"We can hardly avoid here noting that the spirit of this statesman and philosopher, who had done so much to illustrate the path of the winds, should pass away, almost, as it were, on the wings of one of the most extensive, rapidly progressing, and destructive ocean hurricanes on record. First coming under notice at the Windward Islands about the 20th of October, it passed over Porto Rico, Hayti and the Bahamas; then, its axis passed, on the 24th, nearly over Bermuda, where its violence was extraordinary; and thence for some days following it pursued its course to the north-eastward, almost, or quite to the shores of Europe. No storm described by either Redfield or Reid seems to have had the enormous diameter of this one. It was severely felt for 700 miles eastward of Bermuda in the same latitude, while its western border grazed New York, affecting the barometer sensibly, and rolling in upon us the extraordinary tides of October 24th and 25th."

The newspapers both at home and abroad, and, especially of those colonies which Sir William had governed, published appreciative obituary notices of him. The London *Times* gave a sketch of his career, from which one or two paragraphs may be quoted. Referring to his connection with the Great Exhibition of 1851, it observed:—

"It is not too much to say that the success of the Exhibition, at least in its early stages, and, above all, its punctual opening at the appointed time—contrary to the repeated declaration of the French that it could not, and would not be done—were in a great degree owing to his tranquil energy and determination, which in some instances refused even to yield to the highest influence, to which everyone else had given way. At the close of the Exhibition he was made a K.C.B. and the Government of Malta was conferred upon him, which he administered during the Crimean War; and there were not a few persons here who regretted that he had not the administration of the war itself, nearer to the scene of action.

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"He possessed the placid and calm temper of a true philosopher, with a determination to avoid all personal conflicts and disputes—which is sometimes not an accompaniment of philosophy—combined with a rare talent for conducting business, and making his colleagues and subordinates do their best. In private life he was one of the most amiable of men with a pleasant mixture of gravity and cheerfulness. . . ."

Having already quoted freely from an article on Sir William Reid and his administration of the Government of Malta, which appeared in a Malta paper at the time of his relinquishing that Government, I will only add in reference to Malta a few words written to Lady Chamberlain, Sir William's daughter, 30 years after his death. They were written by Sir Adrian Dingli, an able exponent of Maltese opinion, in response to a request for information about Sir William during his residence at Malta, for the benefit of Major-General Whitworth Porter, who was then engaged in writing his *History of the Royal Engineers*. After promising to send some notes about the Malta period of Sir William's life Sir Adrian wrote: "Neither you nor General Porter will consider it overpraise to say that, as far as my experience goes—and I have served as the Crown Advocate for Malta under six successive Governors—he was one of the best Governors we ever had, and no one surpassed him in a combination of sagacity, prudence, firmness, and benevolent determination to carry out the duties of his high position."

A Barbados newspaper after giving a brief account of Sir William Reid's career wrote:—

"It is 11 years since he left these shores, but Barbados still feels the impress of his Government, and there are hearts here which still beat in lively remembrance of his own generous and genial warmth. . . . He moved about the country, mixed with the people, saw everything with his own eyes, and by his zeal and example infused into the officers of the Government, into our agricultural operations, into the maintenance and extension of our social and charitable institutions an energy and a vigour to which we had long been strangers, and which greatly helped us, if we are not mistaken, to tide over the gloomy period of 1847–8."

The Rev. J. Y. Edghill, in his book *About Barbados: Pen and Ink Sketches of our Governors*, London, 1890, refers to Reid in the following terms:—

"He was a tall, soldierly-looking man—high forehead, expressive countenance, especially for firmness. There never was a Governor here who was more frequently seen abroad. Early in the morning he was in the saddle, and to be found in some part of the town or the rural districts. He visited the public institutions frequently—used his eyes, saw everything for himself, and made acquaintance with men and things in all directions and under all phases. . . . He was a man of few words. His public addresses and messages to the Legislature were brief, but clear and emphatic. He was a great temperance man. . . .

"Our education system was then only in its infancy. Colonel Reid, aided by his excellent wife, liberally assisted the existing schools. They visited them, encouraged the teachers, and helped the poorer children. We have seen them sitting on benches in one of the schools listening to the children as they read, and asking them questions on what they had read. Many a bundle of clothing did they take to the schools, and supply to such children as were declared to be deserving of it.

"His Excellency was a patron of the higher education. He founded the Reid School of Practical Chemistry in Bridgetown. . . . He was eminently practical. He saw at a glance the possibilities of things and worked up to the possibilities. We have said he was a philanthropist. But there was nothing mawkish in his philanthropy. . . . We believe there never was a Governor who left Barbados with more affectionate regard from the whole community. . . ."

It must be remembered that the above was written of a Governor who spent only two years in Barbados and who had not been in close touch with the colony since he left it in 1848. Therefore, for such a tribute to be written 40 years afterwards shows that in Barbados his reputation must have been very firmly established.

In Bermuda, Sir William Reid's first Government, which he left two years earlier than Barbados, he was remembered even more warmly. When the news of his death arrived the signs of mourning were marked. The merchant vessels, American as well as English, in the different ports of the islands hoisted their colours at half-mast. The principal Bermudian newspaper gave expression to the general feeling of the community in the following words:—

"The intelligence of the death of this distinguished officer has been received in this colony with deep and unfeigned regret. As Governor of these islands he left behind him here a name and a reputation which have ever been warmly cherished by all classes. . . . The secret of this sentiment of esteem . . . may be found, we believe, in the conviction which all, whether friendly or hostile to Governor Reid's plans, felt of the perfect sincerity of his efforts to promote the good of the colony. That he was single-hearted in this pursuit none ever doubted,

and that his efforts were in general as successful as they were sincere is most unanimously admitted. By his able and conscientious discharge of his high duties, Sir William Reid earned and obtained the approbation of the Crown, and the confidence, nay even the affection, of those whom he governed—a reward not always vouchsafed even to well-intended and well-directed zeal.

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"Inflexibly just, rigidly conscientious, and wholly disinterested in his public, as in private, life, Governor Reid possessed many of the faculties which enter into one's ideal of a great and good man. To these generous qualities of the soul were added no small intellectual capacity, and a determined perseverance and industry which would have fitted him for much more conspicuous posts than those which it was his lot to fill.

"As a Governor he was constantly intent on tracing with precision the narrow path of duty, and when he had discovered it, his courage was inflexible and his constancy unconquerable in the pursuit of it. Such men are not always successful, nor even always judicious in the discharge of political functions, but whether from the character of the times, or from that of the people, it must be allowed that Governor Reid's administration of this Government not only was successful at the time, but, in fact, formed an important era in our humble history. His name still continues, and will long continue to be identified with the material prosperity of this colony, which prosperity he developed to an extent not before dreamed of. Nor did his interest in our progress wax cold when his political connection with Bermuda ceased, for long afterwards he evinced a warm desire to promote and stimulate the industry of our people. . . ."

The good people of Bermuda were not content with these comments in the Press. They determined to show their appreciation of Sir William Reid's services to their islands by some permanent memorial, and, in the year following his death, a resolution was passed by the three branches of the Legislature of the Bermudas voting a sum of £300 for the purpose. The resolution ran as follows:—

"Whereas many important public benefits have been conferred on this Colony by His late Excellency, Colonel William Reid, of the Royal Engineers, who was Her Majesty's Governor and Commander-in-Chief of these islands from an early period of the year 1839 nearly to the end of the year 1846, and who, after his departure from Bermuda was appointed to be Her Majesty's Governor of Barbados, and subsequently Her Majesty's Governor of Malta, and was promoted to be Major General in Her Majesty's Army, and was made a Knight Commander of the Bath; And in order to express the gratitude of this community for his valuable public services, it is expedient that some durable Testimonial to his Memory should be provided at the public expense.

"Resolved, that the Receiver-General be, and he hereby is authorized and required to pay, out of any unappropriated moneys in the Public Treasury, a sum not exceeding Three Hundred Pounds, to be at the

disposal of His Excellency the Governor, or Officer Administering the Government of these Islands, the President of the Council, and the Speaker of the House of Assembly, for the time being, respectively; and to be applied in obtaining and erecting such permanent memorial of Governor Reid, as they may deem most suitable and appropriate for the purpose contemplated; and that such Memorial may be placed on such spot, either within the Sessions House, or the Public Building containing the Council Chamber, in the town of Hamilton, or in such part of the Grounds adjoining either of those Buildings, as may be selected by the Governor, President, and Speaker for that purpose.

"Passed the Assembly this 11th day of July, 1859.

"By order of the House.

"ALER. EWING, *Speaker.*

"Concurred in by the Legislative Council this 12th day of July, 1859.

"JOHN HARVEY DARRELL,
"*President.*

"Assented to this thirteenth day of July, 1859.

"A. T. HEMPHILL,*
"*Acting Governor.*"

Colonel Hemphill, in his capacity of Acting Governor, forwarded this resolution officially to Lieut.-Colonel E. G. Hallewell, who was at that time Deputy Quartermaster-General at Malta, with a view to its communication to Sir William's surviving relatives. Lieut.-Colonel Hallewell acknowledged the compliment paid to his father-in-law's memory in suitable terms. The Hon. John H. Darrell also wrote to him, as to the form the memorial should take, suggesting either an obelisk with inscription, or a bust. To get a bust would have been a very difficult matter as there was hardly any existing material for an artist to work on. So it was decided to erect an obelisk which could be placed for all the world to see.

The following fragment of a letter about Sir William Reid has been preserved and is worth printing. The writer was Major Colin Mackenzie, R.E., stepson of Mary Fyers (sister of Lieut.-General William Fyers, Colonel Commandant, R.E.). She had married, as his second wife, the Rev. Donald Mackenzie, minister of Fodderty, near Dingwall. His son by his first wife, Major Colin Mackenzie, joined the Corps of Royal Engineers as 2nd Lieutenant in 1813. He served in the Netherlands and France (1814—1816), and in Canada (1838—1839). He was promoted Captain in 1834 and retired in 1842. He was given a Brevet Majority in 1854. He died at Bath in 1870.

* Brevet Colonel A. T. Hemphill, commanding the 26th The Cameronian Regiment of Foot.

From Major Colin Mackenzie, R.E., to Lieut.-Colonel Henry Fyers, R.A.

"14, BENNETT STREET, BATH, *1st December*, 1858.

"MY DEAR HENRY FYERS,

"It gave me much pleasure to hear of you and your mother. You will both be to me ever of deep interest.

"My relatives and contemporaries are fast melting away, and one draws close to those remaining who can sympathize with one's antecedents.

"Reid's (departure) is a *great* blank. I agree with you that every incident in a life like his, so thoroughly devoted to his country, should be recorded, not only to frame a life, but as a pattern for posterity.

"In his intercourse with others to impart and to imbibe information, in a spirit of kindness and unostentation, was congenial to him, and in his relations to his younger brother officers, his ruling motive was to lead them to honour and distinction, by stimulating and directing their ambition to an *esprit de corps* and a due appreciation of their vocation; taking advantage of every passing operation in their art, however trivial, to inform them how he had acquired from the accomplished enemy in the Peninsula the best mode of performing it; drawing, from an inexhaustible fund of details he had collected, something new in every conversation; and turning every parade to account by showing his men something new without descending to prolixity.

"His untiring zeal and patient energy with good temper knew no bounds, and, once shown, the operation was repeated until all was perfected. His attribute of firmness was carried by perseverance, but mildness; to be instructed by him was felt by all to be pleasurable, instead of irksome, as is too often the case with officers and soldiers.

"Although often in perilous places and hairbreadth escapes, they were never alluded to, except in the course of conveying his experience in certain operations for the guidance of others.

"The first time I ever met Reid was at the entrance gate of Mons, immediately after the Battle of Waterloo. We (Engineers) were all proceeding to join our divisions in the march to Paris.

"My horses were slight. He told me he trusted to the momentum of a heavy charger and heavy sabre to break through, or cut his way. This he thought equal to, if not an advantage over, an adroit swordsman.

"Thus to the younger officers every word was directed for their benefiting from his great experience in the attack and defence of positions; and having served much with the Light Division it was quite inspiring to hear him." Here the fragment ends.

Reference has already been made to writings by Sir William Reid—some on military subjects—published in 1823, as well as to his great work on *The Law of Storms*, published in 1838. I now add a list, as complete as I have been able to make it, of other publications from his pen.

During the time Reid was on the Unemployed List in 1848 and

1849, after his return home from Barbados, he occupied himself with the preparation of an enlarged and revised edition of his book on storm law. Ten years had elapsed since his celebrated work had appeared. The title of the revised and enlarged volume was: *The Progress and Development of the Law of Storms and of the Variable Winds, with a Practical Application of the Subject to Navigation.* 8vo. London, 1849.

In 1850 he conceived the project of publishing the information received from captains and masters of ships in a series of papers. He edited the first number himself, but there it ended. No second number was published. The serial was entitled: *Narratives written by Sea Commanders, Illustrative of the Law of Storms and of its Practical Application to Navigation.* It was published in 1851 in 8vo. size. Probably Reid found himself too much occupied with the work of the Great Exhibition to continue the publication, and his departure for Malta at the end of 1851, and his onerous duties there, prevented him pursuing his meteorological investigations. His correspondence with Mr. William C. Redfield, the American meteorologist, has been already referred to. Reid's letters to this distinguished scientific man have been presented in three folio volumes to the Library of Yale University.

Before concluding my references to Reid's meteorological pursuits, I must mention that a lady disciple very successfully took up the work he was obliged to resign. Janet Taylor, who wrote *An Epitome of Navigation*, published also *A Diurnal Register for Barometers, Sympiesometers, Thermometers, etc.* In the introduction to this *Register* she says:—

"It is only those, who, having witnessed the devastating whirlwind sweeping all before it over earth and sea, and making the stoutest heart to sink with terror, can fully appreciate the untiring research and indefatigable labour of men whose minds have been devoted to so grand an object; that their observations, however, may become more extensively and practically useful, requires the fullest co-operation of all connected with the seafaring profession. Therefore every attention should be paid by masters of vessels to the atmospheric changes in different parts of the world, and all peculiarities during the approach, duration, and track of storms should be carefully registered, and, when opportunity offers, forwarded to those engaged in formulating such information.

"For this purpose Lieut.-Colonel Reid has suggested 'that to all captains of ports, masters of lighthouses, harbour masters, and others, whose professional pursuits naturally lead them to be constant observers of atmospheric phenomena, all information on the subject of storms and variable winds should be forwarded by masters of vessels, who may have encountered any such storms in their voyages, that the observations may be entered in their journals, and forwarded to those appointed by Government to receive them.'"

The *Register* ran through many editions; the 6th edition was published in 1852, and was dedicated by the authoress to Sir William Reid, by permission, and the dedication, which has a savour of the 18th century about it, runs as follows:—

"DEAR SIR,

"I am deeply sensible of the honour conferred on this edition of my little work by your kind permission to place it under your distinguished patronage.

"Whatever country has had the good fortune to own your command, will revere your name for the lasting benefits you have conferred on your fellow man; and your own countrymen must ever regard you with feelings of the highest gratitude and admiration for talents which have been particularly devoted to the development of a science, so important to us as a maritime nation. You have taught us to track the wild cyclone in its course, to elude its violence and, when under favouring circumstances, even to make subservient to our purposes its mighty powers.

"All this elevation of mind has not rendered you regardless of the feelings of others less gifted than yourself, but appears to have given a higher tone to that urbanity of character, by which you are so universally distinguished; and I feel happy in having this opportunity of offering my grateful acknowledgments for your many acts of kindness and consideration towards myself.

"With sentiments of sincere respect I subscribe myself,

"Dear Sir, your obliged and humble servant,

"JANET TAYLOR.

"104, Minories, 1st January, 1852."

Another author, G. Jinman, wrote a meteorological book referring to Sir William Reid's work. The book was published in 1861, entitled *Winds and their Courses, with an Examination of the Circular Theory of Storms, as propounded by Sir William Reid.*

It is a well-known but nevertheless remarkable fact that the busier a man is, the more ready will he be to respond to any outside call upon his time. So it was with Reid. He was always ready at the call of the editor of the *Corps Professional Papers* to write papers for the benefit of his brother officers, and when the *Corps Professional Papers* were first started in 1837 he contributed no less than seven papers to the 1st Volume.

The following is a list of the papers showing the subjects which engaged his attention:—

Professional Papers of the Corps of Royal Engineers.

Vol. I., 1837.

1. "On Assaults."
2. "Forts of Salamanca and Fortress of Burgos."
3. "Account of the Attack of Fort Laredo, near Santoña."
4. "Description of the Concrete Sea Wall at Brighton, and the Groynes which Defend the Foot of It."

5. "A Short Account of the Failure of a Part of the Brighton Chain Pier in the Gale of 30 Nov., 1836."

6. "Hints for the Compilation of an Aide-Mémoire for the Corps of Royal Engineers."

7. "On the Destruction of Stone Bridges."

Vol. II., 1838.

1. "On Entrenchments as Supports in Battle, and on the Necessity of Completing the Military Organization of the Royal Engineers."

2. "Further Observations on the Moving of the Shingle of the Beach along the Coast."

3. "On Hurricanes."

Vol. III., 1839.

1. "On the Decomposition of Metallic Iron in Salt Water, and of its Reconstruction in a Mineral Form."

Vol. IV., 1840.

1. "On Lodging Troops in Fortresses at their Alarm Posts."

Vol. X., 1849.

1. "Properties in Cultivation in St. Lucia."

Before completing this memoir by giving particulars of Sir William Reid's descendants, it seems desirable to examine the imprint which his character—derived from the story of his life and from the records of contemporary opinion—makes upon us.

From the very beginning of his active service as a subaltern in the Peninsula down to his last service in the Government of Malta, Reid seems to have impressed himself personally on all with whom he came in contact.

In war his activity, energy, pluck, and devotion to duty, amounting almost to enthusiasm, won him the recognition and cordial regard no less of his comrades than of his commanders. The extraordinary complication of circumstances, by which the rewards that were his due were denied him when he came home, must have been a serious trial to a young man fresh from the triumphs of the field and the approval of his Generals. The sense of justice, so strong in him, rebelled, and might even have wrecked his life, had not his openness to reason and natural persistency combined stood him in stead. His uncle and godfather, General William Fyers, was a true friend at this crisis of his life, and the struggle Reid then passed through cannot but have strengthened his character. His determination to be patient but not to allow himself to be snuffed out, enabled him to carry the point about which he was so sensitive, and to secure the hall-mark of brevet rank for service in the field, on which he had set his heart, as the official recognition of his claim.

In his scientific work the same enthusiasm, the same energy, the same persistency carried him through long, laborious and patient

investigations, until after many years he achieved a result at once so useful to mankind and so honourable to himself.

And lastly, in high and responsible positions, the qualities recognized by all in contemporary records stand out: the sincerity of the man; his strong sense of justice; his painstaking, personal investigations; his accessibility to all whether high or low; his perception of the limitations of all projects for benefiting the people, and his determination within those limitations to do all that could be done, without fuss and without unnecessary talk. His manner was dignified and no one could venture to take a liberty with him, but there was an innate modesty in him which made him very lovable. He hated all self-advertisement. Seldom has a man occupied three successive Governments, embracing altogether a period of over 16 years, as Sir William Reid did, and yet been so fortunate as to leave behind him in all three an estimation of himself and of his services which can best be summed up in the expressions that have been used:—"He was a great and good man." "He was 'The Good Governor.'"

There is a print of Sir William Reid in the R.E. Mess at Chatham showing him in plain clothes with the riband of the G.C.M.G. It is after a portrait by J. Lane, engraved by Haubart. This print has been reproduced to illustrate my memoir. I regret that a photograph kindly lent me by Colonel Hore which was a copy of a sketch of Sir William in uniform when he was a young man was found to be too faint for reproduction.

By his wife, Sarah Bolland, Sir William Reid had eight children; viz., one son and seven daughters.

I. Frances Reid, born at Brompton Barracks, Chatham, on the 5th August, 1819; died the following February.

II. Lucy Alexandrina Reid, born at Brompton Barracks, Chatham, on the 3rd November, 1820; died unmarried at Woolwich on the 24th October, 1850, and was buried at Charlton.

III. Maria Reid, born at Woolwich, on the 5th December, 1822; married at Barbados, West Indies, on the 17th June, 1847, EDWARD GEORGE HORE (1823—1871), 2nd son of Herbert William Hore of Pole Hore, co. Wexford, Midshipman, H.M.S. *Princess Charlotte*. He served in the Crimea and the Baltic, became Captain, R.N., and was principal Naval Attaché to the British Embassy in Paris, 1860—1871. He died in London on 22nd September, 1871. His wife died in London on the 14th April, 1897. The issue of the marriage was four sons:—

(1). Edward Hore, born 17th November, 1849, at Woolwich; married (1st) Minnie Barrett, by whom he had two daughters, (*a*) Maria Sydney, (*b*) Edith Figi. Married 2ndly Laura Trafford, widow of Henry Trafford Trafford, Captain, Rifle Brigade, and daughter of Percy Barker Pierce, of Southlake Manor, Berks.

(2). Gilbert Houston Stewart Hore, born on the 2nd January, 1854, at Malta; died at Gosport, 27th January, 1866.

(3). Henry Reid Hore, born on the 25th January, 1856, at Malta; died of fever on the 13th March, 1894, at Fort Salisbury, South Africa.

(4). CHARLES OWEN HORE, born on the 2nd September, 1860, at Paris. Joined the 38th Foot (South Staffordshire), 11th May, 1878. Served in the *Egyptian Campaign of 1882:* with the Mounted Infantry at Reconnaissance of 5th August, and in actions at El-Magfar, Tel el Mahuta, Mahsameh and Kassassin, Battle of Tel-el-Kebir, forced march to Cairo and occupation of the capital, which surrendered on 15th September, 1882 (medal with clasp, bronze star, 5th Class Medjidie). In *Nile Expedition, 1884-5.* With Mounted Infantry; both actions at Abu Klea; El-Gubat; Metammeh (2 clasps). In *Nile Expedition, 1898.* Attached as Staff Officer to Egyptian Cavalry; Battle of Khartoum, mentioned in despatches, *London Gazette,* 9th December, 1898 (Brevet Lieut.-Colonel, Egyptian Medal with clasp, medal). In *South African War, 1899—1900.* Special Service Officer. Raised, organized and commanded (until 10th July, 1900) the "Protectorate Regiment"; defence of Mafeking, including actions of 26th December, 1899, and 12th May, 1900; operations in the Transvaal, west of Pretoria, July to 29th November, 1900, including actions at Elands River (4th to 16th August). Mentioned in despatches, *London Gazette,* 8th February, 1901 (Queen's Medal and 3 clasps, C.M.G.). He was Adjutant of the 2nd South Staffordshire, 1892 and 1893; commanded the Mounted Infantry in Egypt, 1894 to 1899; commanded "Protectorate Regiment," 1899 to 1900; commanded 2nd Royal Garrison Regiment at Gibraltar, 1901 to 1905. He married at Leamington, on 23rd January, 1889, Dulcibella Eden Radcliffe, daughter of General Travis Radcliffe, by Mary, his wife, daughter of General Cumberlege, Madras Cavalry, and by her has issue:—

A daughter, Kathleen Dulcibella Hore, born at The Curragh, co. Kildare, on the 15th February, 1890. She married at Chelsea, on the 14th October, 1908, HENRY RICHARDSON PECK, Brevet Major, Royal Horse Artillery, son of the late P. W. R. Peck, of Templecome House, Somersetshire, and of Mrs. Peck, of Maidencombe House, St. Mary Church, S. Devon.

IV. Sophia Lonsdale Reid, born at Brompton, Chatham, on the 9th January, 1824; married at Bermuda, on the 11th May, 1843, EDMUND GILLING HALLEWELL, 20th Foot, born in 1821, eldest son of Edward Gilling Hallewell (d. 1881), M.P. for Newry, by his wife, daughter and heiress of Joseph Watts, of Stratford House, Gloucester. Hallewell served on his father-in-law's Staff as a Captain in Malta until the *Crimean War* of 1854–55, when he was Deputy Assistant Quartermaster-General to the Light Division. He took part in the Battles of Alma and Inkerman, and in the Siege of Sebastopol (medal and 3 clasps, brevets of Major and Lieut.-Colonel, Legion of Honour, 5th Class Medjidie, and Turkish Medal. Returned afterwards to Malta as Deputy Quartermaster-General. In 1864 Colonel Hallewell was appointed Commandant of the Royal Military College at Sandhurst, and died while holding that appointment in May, 1869. Besides two children who died in infancy he had three children, two sons and a daughter, viz.:—

(1). Edmund Hallewell, born at Kingston, Canada West, on the 22nd January, 1849. Died without issue at Southsea.

(2). HENRY LONSDALE HALLEWELL, born near Stroud, on the 3rd October, 1852; joined the Royal Scots Regiment, did good service in India during the Bengal Famine in 1874, and was mentioned in despatches. He was a Deputy Assistant Adjutant-General at Headquarters, London, from 1881 to 1886, and was sent as a Special Service Officer to join Sir Gerald Graham in the Suakin Campaign of 1884; he served as a transport officer (medal with clasp and bronze star). He served also in the Nile Expedition of 1884–5 under Lord Wolseley, but was invalided home on account of sunstroke (additional clasp). From 1886 to 1891 he served with his regiment in South Africa and took part in the operations in Zululand. He retired from the Army in 1892. He served in the Boer War as 2nd in command of the Queenstown (Cape Colony) Rifle Volunteers; he was mentioned in despatches and made a C.M.G. for his defence of Helpmakaar (medal and 2 clasps). On his return home he volunteered for service at the Royal Scots Depôt, Glencorse, N.B. He was promoted Brevet Lieut.-Colonel for his services. He married (1st), in 1876, Charlotte Caroline Peareth, daughter of William Peareth, of Usworth, co. Durham. She died in 1879, having had issue:

(*a*) A daughter, Charlotte Caroline Hallewell, who married, in 1902, Maurice William Skene-Tytler, of Keith Marischal, Pencaitland, East Lothian.

Lieut.-Colonel H. L. Hallewell married (2nd), in 1881, Emily Jane Fraser-Tytler, 3rd daughter of James Stewart Fraser-Tytler, of Woodhouslee, Midlothian, by whom he had issue two children :—

(*b*) Alice Margaret Hallewell, married, in 1910, Christopher Elphinstone Seton, Barrister-at-Law.

(*c*) EDMUND GILLING HALLEWELL, born at Cape Town in 1887, late Midshipman, R.N., who married, in 1909, Dorothy Margaret Lennox Jepherson, daughter of A. Jepherson, by his wife, Georgina Peareth, and granddaughter of Mrs. Peareth Lennox, of Lennox Castle, Stirlingshire. There is a son of this marriage, John Lennox Hallewell, born in 1910.

Lieut.-Colonel H. L. Hallewell died at Bentley, Farnham, on the 23rd June, 1908.

(3). Sophia Lonsdale Martha Hallewell, born at Malta on the 15th November, 1858. Died unmarried.

V. Edmund Hay Reid, born at Mountjoy, Phœnix Park, Dublin, in 1825, and died in the following year.

VI. Elizabeth Oakley Reid, born at Mountjoy, Phœnix Park, Dublin, on the 5th November, 1827 ; married at Cheltenham, on the 16th January, 1849, the Rev. Charles Gore Gambier Gambier, M.A., Oxon. (1824—1891), of the Toft, Sharnbrook, Bedfordshire, son of Admiral Fitzgerald Gambier, and nephew of James, 1st Baron Gambier, Admiral of the Fleet (1765—1817). She died at Bournemouth on 1st December, 1892, having had issue eight children :—

(1). Miriam Gore Gambier, born 10th October, 1852 ; died unmarried 17th December, 1882.

(2). Mabel Lucy Gore Gambier, born in 1854.

(3). Margaret Gore Gambier, born in 1855 ; married, in 1879, James Browning Young, Captain, R.N. Has issue :

(*a*) MAURICE JAMES DUKE YOUNG, born 8th September, 1880, Captain, The Devon Regiment ; married, in 1909, Margery Pain, daughter of the late Colonel Pain.

(*b*) Cicely Margaret Young, born in 1882.

(*c*) MARTIN YOUNG, born in 1884, York and Lancaster Regiment. Deceased.

(4). Mary Grace Gore Gambier, born in 1856 ; married, in December, 1892, Henry Brough Stanwell, M.A., Cambridge.

(5). Elizabeth Caroline Gore Gambier, born in 1857.

(6). Sarah Caroline Gore Gambier, born in 1859 ; married, on 2nd July, 1891, Cuthbert Eden Heath, of Ainstie Grange, Dorking, and of Lloyds, E.C., son of Admiral Sir Leopold Heath, K.C.B., and has issue :

(*a*) Leopold Cuthbert Heath, born 28th May, 1894.

(*b*) Genesta Mary, born in 1899.

(7). Robert Gore Gambier, born in 1860; died in 1893.

(8). Michael Seymour Gore Gambier, born in 1861; married at Netley Marsh, Hants, on the 19th August, 1903, Irene Marion Bentley, daughter of Arthur Francis Bentley, of Woodlands, Totton, Hants, and has issue:

(*a*) Robert Michael Gore Gambier, born in 1904.

(*b*) Paul Bentley Gore Gambier, born in 1907.

VII. Charlotte Cuyler Reid, born at Brighton on the 21st November, 1835; married, on the 26th June, 1873, Field Marshal Sir Neville Bowles Chamberlain, G.C.B., etc., etc., the distinguished Indian commander whose life has lately been published. Lady Chamberlain died without issue at Lordswood, Southampton, on the 26th December, 1896. The Field Marshal died at the same place on the 18th February, 1902.

VIII. Grace Reid, born at Portsmouth on the 11th June, 1838; married Capt. Basil Sidmouth de Ros Hall, R.N. (1833—1871), son of Capt. Basil Hall, R.N., the explorer and author, and has issue:—

(1). BASIL WILLIAM REID HALL, born on the 31st October, 1865. Lieutenant, R.N. (*retired*). Served in H.M.S. *Superb* at the bombardment of Alexandria (medal with clasp, bronze star); is Inspector, Royal Lifeboat Institution for the East Coast of England. He married, in 1894, Cecil Mary Ashburnham, daughter of the late John Woodgate Ashburnham.

(2). LIONEL ERSKINE HALL, born 18th July, 1868, formerly Captain, 4th Batt. South Staffordshire Regiment; married, in 1897, Jane Augusta Reynolds, daughter of the late Thomas Leethem Reynolds, and has issue living:

(*a*) Lionel Reid Hall, born 1st February, 1898.

(*b*) Neville Reynolds Hall, born 6th February, 1900.

(*c*) Douglas Basil Hall, born 1st February, 1909.

(3). Helen Sarah Margaret Hall, born on 4th February, 1870; died 25th December, 1881.

MEMOIR.

MAJOR-GENERAL EDWARD RENOUARD JAMES, ROYAL ENGINEERS.

(*Concluded*).

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

On returning to military duty on the 1st February, 1859, Lieut. James was appointed to the Ordnance Survey, relieving Capt. R. Stotherd in charge of one of the three divisions at Carlisle; Capt. E. N. Heygate, and Lieut. H. Helsham-Jones, James's comrade in Asia Minor in 1857, were in charge of the other two divisions. On the 1st April the same year James was promoted to be 2nd Captain.

One of his duties on the Survey was the field examination of maps, in order to test their accuracy before they were sent on completion to Southampton for reduction. This duty had a special attraction for James, as it led him on foot through some of the most beautiful scenery of the district. During the 13 years he was employed on the Ordnance Survey he managed to see in a very minute manner a great deal of the charm of English scenery in various parts of the country. He frequently walked as much as 25 miles in one day. Writing of these field examinations in the Carlisle Survey District he says:—

"I did not myself think that the officer's examination on the ground was worth its cost, but the duty was exacted from me, and I did not complain. The charm of beautiful scenery was always irresistible to me, and I retain the most vivid remembrance of each day's walk. In Cumberland and Westmoreland I saw every lake, and ascended Scafell, Skiddaw, Helvellyn and Saddleback. In Northumberland I explored the valley of the Tyne as well as the valleys of the border rivers of the Tweed and the Teviot. . . . In turn I visited every town and place of interest in the northern counties of England and the southern counties of Scotland, remaining six years at Carlisle as my headquarters."

On the 10th July, 1860, Capt. James married, in Carlisle Cathedral, Eleanor Agnes Fawcett, second daughter of John Fawcett of Petterill Bank, Carlisle. A daughter, Eleanor Amie, the only child, was born to them on the 21st January, 1864.

In June, 1865, James moved with the whole of his Ordnance Survey Division to Guildford in Surrey. On the 23rd August, 1865, he was promoted to be First Captain. With Guildford as his headquarters he began the tertiary levelling for the south of England in Kent, Surrey, Sussex, Hampshire, Berkshire, and Oxfordshire, visiting all parts of those counties in succession. Besides the levelling he had contouring and detail surveying to superintend.

In addition to his survey work James was frequently called upon to assist in other Government work. A special case occurred after the passing of the Franchise Act of 1866. In the following year a Royal Commission was appointed to enquire into the boundaries of Parliamentary boroughs. The whole of England was divided into districts and two Assistant Commissioners apportioned to each district; these were generally an officer of Royal Engineers and a barrister. Capt. James and a young barrister, Mr. Ralph Palmer, a cousin of Sir Roundell Palmer (afterwards 1st Earl of Selborne), were appointed Assistant Commissioners to conduct enquiries as to the boundaries of the boroughs of Bedford, Peterborough, Huntingdon, Hertford, Cambridge, Marlow, Great Wycombe, Aylesbury, Banbury, Buckingham, Northampton, Woodstock and Oxford. The work occupied the months of August, September, and October, 1867, and James found it both interesting and pleasant, bringing him into acquaintance with many men worth knowing.

Another case was an order from the head office at Southampton to go to Battle Abbey to meet Mr. E. A. Freeman, the historian of the Norman Conquest, and to take his instructions with the view of preparing a plan to illustrate the Battle of Hastings. Mr. Freeman was accompanied by Mr. J. Bryce, author of *The Holy Roman Empire*, now British Ambassador at Washington, and in company of these two James passed a long-remembered day. As they walked over the very scenes of the fighting, Mr. Freeman described the incidents of the battle, showing an intimate acquaintance with his subject and an equal assurance that his conclusions were absolutely correct. The plan, which James made as the result of this visit to Battle, may be found in Vol. III. of *The Norman Conquest*. In the preface to that volume his assistance is gratefully acknowledged by the author, and the Clarendon Press of Oxford University presented James with a copy of the work.*

Another duty he undertook, in common with many officers of the Corps, was the inspection of Science and Art Schools under the Science

* Major-General James made a further study on the ground of the Battle of Hastings on his own account many years later. He then had the assistance of the Hon. F. H. Baring. He came to the conclusion that Freeman's views required considerable modification. He contributed a paper to the *Royal Engineers Journal* of January, 1907, on the subject, with a new plan of the battle.

and Art Department of South Kensington. The schools of the whole country were inspected in February and the examinations, which were conducted throughout the month of May of each year, were also visited by these temporary inspectors. On one occasion he inspected the Science and Art Classes at Oxford. He had already made the acquaintance of the chairman of the local Science and Art Committee, Dr. (afterwards Sir) Henry Acland, at the time of the Parliamentary boundary enquiry. On that occasion, during the fortnight the enquiry lasted, he was the guest of the Principal of St. Mary Hall and, dining each day in the Common Room of Oriel, met Dr. Acland, Dean Burgon and other distinguished Oxford men.

On James's arrival in Oxford to inspect the Science and Art Classes Dr. Acland insisted that he should stay over Sunday with him, and on that day took him over to an early dinner with John Ruskin at an old-fashioned inn at Abingdon. James jotted down his recollections of that memorable Sunday, and it is interesting to read his impressions. He says in the notes that he made of the conversation in his diary :—

"I never passed a day in my life more pleasantly, for Ruskin was a perfect host with a remarkable suavity of manner; and though he was a veritable egotist, it would be impossible to forget the musical tone of his voice, and the eloquence of his conversation. In the matter of his discourse *I cannot say I found myself in agreement with him.* In the first place *I* represented South Kensington, the teaching of which institution was, in his opinion, an absolute crime against Art (with a big A); while *he* was professor of the Slade School at Oxford, which was founded on wholly different principles. Though, doubtless, he was a beautiful artist himself, and one of the greatest critics the world of Art has known, I could not agree with his teaching. He objected to the use of scale and compasses, or to geometrical aid of any kind in design.

"An artist he held was born and not made; the eye and hand of one who had the gift of seeing the beautiful, might be trained by constant observation and long practice, but without this gift of nature in the soul, no amount of mechanical teaching could ever result in good work. South Kensington, he said, had never made an artist, but had spoiled many. He would point to two leaves from a tree or two natural objects of any description, as a proof that Nature abhorred a perfect resemblance between any two things. The mechanical repetition of objects by numbers was, according to his ideas, simply criminal. All this was expressed in most poetical language; in his charming way, which enthralled his listeners.

"On my side of the question, after referring to the miserable national taste which, by general consent, existed in England in the Early Victorian days, I asserted that the undoubted improvement which had been effected in the arts of design and decoration since the Great Exhibition of 1851, had been due, mainly, to the establishment of the Science and Art Department. True canons of line and colour were now taught to

artizans, and articles of great beauty for domestic use—such as furniture, wall papers, carpets, iron, brass, woodwork and earthenware, etc., were now made by the thousand pieces, at a cost within the means of all.

"Mr. Ruskin replied that in the palmy days of mediæval art, the artists, who made works of beauty, one of which is valued higher to-day than a whole thousand of mechanically made articles, starved for love of their art.

"The conditions of art production, said I, were certainly very different than they are now, but the single object, beautiful as it might be, was hid amid the cabinets of some king or prince, whereas the multiplied article gives pleasure to the entire nation; and it can scarcely be disputed that the latter, in helping to refine mankind, has benefited humanity infinitely more than the former. And I ventured to say, further, that the great artists—Michael Angelo, Benvenuto Cellini, Albrecht Dürer, and others—did not quite starve; the only difference between their condition, and that of many artists of our day (who do, often, starve), being that they were the paid servants of the Medici and others.

"Mr. Ruskin and I argued the matter all a summer's afternoon, without agreeing. On leaving him, I apologized for the presumption with which a young man had dared to differ from so renowned a critic, and he smiled graciously, as though he thought I should know better when I was older."

Since James parted with his friend Charlie Gordon at Constantinople in 1858, Gordon had been away from England. He had taken part in the war with China and had afterwards distinguished himself, as Commander of the Chinese "Ever-Victorious Army," in the suppression of the Taiping Rebellion. He returned home soon after James had settled at Guildford, and he was appointed Commanding Royal Engineer at Gravesend. As Kent formed part of James's Survey district he put up with his old friend whenever he found himself in that neighbourhood. Of one of these visits he says: "I remember the pride with which he showed me his 'Kings,' as he called his street Arabs, the forerunners of the waifs at the Gordon Boys' Home, and his stopping at a corner to talk with them. Gordon provided liberally for my comfort, but the simplicity of his own life was remarkable."

James sometimes visited a great-uncle, living in Kent, not far from Gravesend, possessor of a famous library. This was the Rector of Swanscombe, George Cecil Renouard, a distinguished Orientalist and a notable linguist, of whom it was said that when a boy at Charterhouse he kept a diary in French, German, Italian and Spanish in turn. He was a Fellow of Sidney Sussex College, and Lord Almoner's Professor of Arabic at Cambridge. He died in 1867, aged 87, bequeathing to James a small legacy, and the family papers, which afforded James pleasant occupation later in life. Another relative in Kent whom he visited was his uncle, the Rev. John

Buckner, Vicar of Bapchild, Sittingbourne, who had married his mother's sister. Mr. Buckner's daughter, Augusta, Mrs. Whitehead Gascoyne, also lived at Sittingbourne.

During his stay at Guildford James endeavoured to trace that part of the Pilgrims' Way to Canterbury which runs through West Surrey. After much research and investigations during long walks, he claimed to have done so, and wrote a pamphlet on the subject, which was sold at the Bath and West of England Agricultural Society's Show held at Shalford Park, near Guildford, in 1871. It was entitled *The Pilgrims' Way in West Surrey*. It has been reprinted in an artistic little book, *Three Surrey Churches*. He seems to have traced the route followed by the pilgrims from near Farnham, where they entered West Surrey, to beyond Dorking, where they passed into East Surrey. He showed that many of the ancient fairs owed their origin to the pilgrimage. One of these fairs was held for centuries on what is now Shalford Park, through which the Pilgrims' Way ran. The summer pilgrims, passing by Loseley Park, crossed the Wey near St. Catherine's Chapel to reach Shalford Park, and after the fair, went by the Spital Lane to St. Martha's Hill.

In the course of his investigations James discovered that in two places near the Pilgrims' Way local tradition recorded that John Bunyan had stayed there, and this discovery led him to advance the theory that Bunyan had used the old Pilgrim's Way as a basis for his allegory of the *Pilgrim's Progress*. He considered that St. Martha's Hill exactly fitted Bunyan's description of the "Hill Difficulty," and other points along the "Way" might without violence be accepted as the origin of the Slough of Despond and of the Delectable Mountains. He found a farm on Banstead Downs (lying, as described by Bunyan, not in the "Way" but near it) which bore the name of Doubting or Dowding Castle; and he conceived that the great annual fair held at Shalford might have been the original "Vanity Fair."

It was with great regret that in the spring of 1872, on receiving orders for Malta, James gave up his work on the Ordnance Survey and left Guildford, where he had lived so happily for over six years, where his father and grandfather had lived before him, and where he knew everyone worth knowing for miles round. From the civilians employed under him he received an illuminated address, while another address was presented to him by a deputation of the inhabitants, headed by the Mayor of Guildford, thanking him for all the work he had done and the interest he had taken in the promotion of the establishment of Science and Art Classes in the town.

James arrived at Malta in the middle of May, 1872. On the 5th July following all the First Captains of the Corps were made Majors and James among them. His duties at Malta, where he remained for five years, were of the ordinary kind. In addition to

military duties he had charge of the Valetta R.E. Division. He enjoyed the life at Malta, the gaieties of the winter season, the opera, the succession of parties of every description, and he regularly went to the Continent for his two months' leave during the hot weather. In this way he visited Switzerland and the South of France, thoroughly explored Italy, and learnt to speak Italian.

Two incidents of note occurred during James's tour of duty at Malta. The destruction by fire in 1873 of Barry's beautiful Opera House; and the visit of H.R.H. the Prince of Wales (our late King Edward VII.) in 1876 on his return from India. The Prince stayed in the island for some days and Malta was *en fête* all the time. James happened to be Field Officer on duty on the night of the 24th May, 1873, when the Opera House caught fire. It broke out about 10 p.m. just as he was going his rounds. The fire arrangements were as bad as they could be, and although the regiments quartered in Valetta and Floriana were at once summoned and did their best, the water supply was altogether insufficient and the Opera House was gutted. Street fires are almost unknown at Malta and there was no proper fire organization existing. The Opera House was restored in its original form in two years' time.

Colonel Charles George Gordon, who had been appointed to succeed Sir John Stokes as British Commissioner on the Danube in 1871, on his arrival at Galatz in November of that year, wrote a long letter to James and the two friends continued to correspond all the time James was at Malta. Thirteen letters in all have been preserved, three from Turkey, nine from Egypt and the Soudan, and one from Abyssinia in December, 1879. They were all carefully treasured and docketed by James, who valued them as precious mementos of his old friend, who died the hero of Khartoum. I would gladly have given extracts from these letters but my space is limited as it has been arranged to bring this memoir to a close this month.

James returned home from Malta in the summer of 1877 and, on the expiration of his leave of absence, was ordered to Cork Harbour. He had only been there a short time when his promotion to be Regimental Lieutenant-Colonel necessitated a move. He succeeded Colonel Whitworth Porter as Commanding Royal Engineer of the Dublin District. Colonel T. Murray was then Commanding Royal Engineer in Ireland and later Colonel H. Wray.

In 1880 the services of Lieut.-Colonel James and other officers of Royal Engineers were lent to the Irish Board of Works to enable that Board to cope with the large amount of work thrown upon it by the Relief of Distress Act. The Chairman of the Irish Board of Works was Colonel (afterwards Sir) J. G. McKerlie, R.E., and the principal work at first to be done by these special officers was the holding of public enquiries into the applications for loans for public works from the districts in which it was alleged that distress existed.

The duty entailed a great deal of travelling about certain parts of the island; it enabled James to see for himself what the state of the country was and led him to ponder over the complex circumstances which had induced such a condition of affairs, with the result that he was a determined opponent of Home Rule for Ireland.

In January, 1881, James resumed his military duties as Commanding Royal Engineer of the Dublin District and was very busy visiting all the stations in it. The district occupied, roughly speaking, the whole central part of Ireland from St. George's Channel to the Atlantic Ocean. He was promoted to be Brevet Colonel on the 1st October, 1881. On the 10th April, 1882, Mrs. James died after a lingering and painful illness.

On the 1st October in this year James completed his five years as a Regimental Lieutenant-Colonel and had consequently to leave the Corps. He found that practically if he went on half-pay there was little chance of military employment, and as he was one of the favoured officers who were given compensation for loss of prospects on account of the changes which took place in 1877, he elected to retire on an annuity of £600 a year with the honorary rank of Major-General. He was then only 49 years of age.

James was offered and accepted the appointment of an Assistant Commissioner to the Irish Board of Works. There is no doubt he anticipated a successful career in the Civil Service of the Crown and looked forward to perhaps another 16 years in that service and to a day when he would succeed Colonel McKerlie as Chairman of the Board. As it was his salary was fixed at £800, but while he was so employed he could not draw his military pension. He was therefore agreeing to work in a very responsible and heavily laden office for £200 a year. He was charged with the organization and administration of Section 31 of the Land Law Act of 1881, which provided for the first time the granting of direct loans to tenants for the improvement of their holdings.

The Board of Works was composed of Colonel McKerlie (Chairman) and two other Commissioners; Mr. William Lefanu, a sportsman and the author of the delightful volume of recollections entitled *Irish Wit and Humour*, and Mr. Ussher Roberts, a well-known hunting man and authority on horse flesh. James had chiefly to do with Mr. Lefanu, who lived at Bray. They became quite intimate and James made the acquaintance of other well-known wits—Father Healy of Bray and Judges Lawson and Murphy. James was given a free hand and instructed to frame the procedure of his office *ab initio*. The loans previously made for land improvements had been to landlords only, and the department of the Board charged with their administration was separate and distinct from that over which James presided. James was tentatively given four inspectors, one for each province. Two of these were officers of Royal Engineers, Lieuts.

H. E. Rawson and N. M. Lake, now both Colonels on the Retired List and well known for the good work they have done in the Service. The number of loans, however, increased so rapidly that the inspectors had to be multiplied to keep pace until there were 36 of them.

James thoroughly enjoyed the travelling about the country and seeing new places which his office entailed. His delight in beautiful scenery was not quenched, even when it had to be exercised at the cost of putting up at the wretched inns of Irish villages of 25 years ago. In the course of his duties he had learned to know the south of Scotland and the greater part of England very well, and since he had been in Ireland he had seen a good deal of the island. But his employment as Assistant Commissioner now led him into every corner of it. His only regret was that being always on duty the gratification of his passion for scenery had to be made a matter of second importance and he had to content himself with a cursory glance when he would have devoted gladly many hours.

After he had been nearly three years an Assistant Commissioner of the Irish Board of Works, the administrations of loans to landlords was transferred to his department, greatly increasing his work; but it was a tribute to the efficiency of the organization he had devised for the administration of loans to tenants that the same system was directed to be adopted for loans to landlords in substitution for the method previously in force. The retirement of Colonel McKerlie, the Chairman of the Board of Works, had already taken place and the successor appointed to this office was the late Major-General Sir Richard Sankey of the Indian Engineers. James saw no hope of preferment and nothing but an increase of salary on account of the extra work thrown upon him would induce him to remain under the Board. The increase of salary was strongly recommended by the Castle authorities, but the Treasury refused to grant it and James resigned. It seems to have been a short-sighted policy on the part of the Treasury from a financial point of view, as provision had to be made for James to draw his pension of £600 a year on the Army Estimates while his successor drew the salary of the relinquished post on the Irish Estimates, costing the country a good deal more than the retention of Major-General James's services would have done.

Of the many regiments which James had met in the course of his service in the Crimea, in Malta, and in Ireland, none interested him more than the 1st Royal Dragoons which was stationed in Dublin while he was Commanding Royal Engineer of the Dublin District and was at the time commanded by Colonel (now Major-General) Frank Russell. It so happened that in 1880 there had been a discussion in the *Royal Engineers Journal* on the *Memoirs of Capt. George Carleton* (see numbers for May, June, October and November of that year). Carleton's Memoirs treated of the War of Succession in Spain and

General James wrote to the editor that he was in possession of an old MS. journal, kept by an ancestor, who served in the Royal Dragoons during that war, and asked whether, if he deciphered and transcribed it, it would be accepted for the *Royal Engineers Journal*. This *Journal of Colonel de St. Pierre of the Royal Dragoons in the War of the Spanish Succession, 1703—1713*, duly appeared in the *Royal Engineers Journal*, beginning in Vol. XI., No. 132, November, 1881, and ending in May, 1882. It was afterwards issued as a pamphlet of 82 pages and 3 maps in 1882.

Colonel de St. Pierre's Journal contained an account of the movements of the Royal Dragoons with lists of the officers serving in the regiment during the period to which it referred. His narrative corroborated that of Carleton, which made it doubly valuable in a literary sense. It came into James's possession with the family papers left him by his great-uncle, the Rev. George Cecil Renouard, Rector of Swanscombe, to whom reference has already been made. It was not until James was in Dublin that opportunity had offered to examine these papers.

Until James deciphered it in 1880 the existence and purport of the MS. had not apparently been known even to his own family. James says of his ancestor: "Colonel Jacques de St. Pierre married Marie Renouard; their daughter Elizabeth became the wife of the Rev. John Henry Ott, and was the mother of Mary Ott, born in 1732; Pierre Renouard, brother-in-law of Colonel Jacques de St. Pierre, was an officer in the same regiment, and his son Peter Renouard married Mary Ott, his first cousin once removed. The daughter of this marriage was my grandmother, Mrs. John James."

This Pierre Renouard of the Royal Dragoons served in Spain with the regiment and as Aide-de-Camp to the Earl of Peterborough as well as to the Arch Duke Charles. So that his brother-in-law, Jacques de St. Pierre, no doubt derived his information from the best sources. Both General Ainslie, the Colonel of the Regiment, and Colonel Frank Russell, the Lieut.-Colonel in Command, sent James warm acknowledgments when he presented them each with a copy of the pamphlet, expressing their sense of its value to the regiment. It was quite new to them and was the most important addition to the Regimental Records that had been received for many a day, as, in fact, it gave unknown history of a century earlier than was then included. Colonel Frank Russell published, in 1887, a *Memoir of the Earl of Peterborough* and mentioned in the preface that the idea of writing it was first suggested to him by the *Journal of Colonel Jacques de St. Pierre*.

After leaving the Irish Board of Works in August, 1885, James travelled on the Continent and spent the winter in London. In 1886 he went to reside at Merrow, Guildford, and remained there until 1890. Then for a whole year he travelled through Belgium,

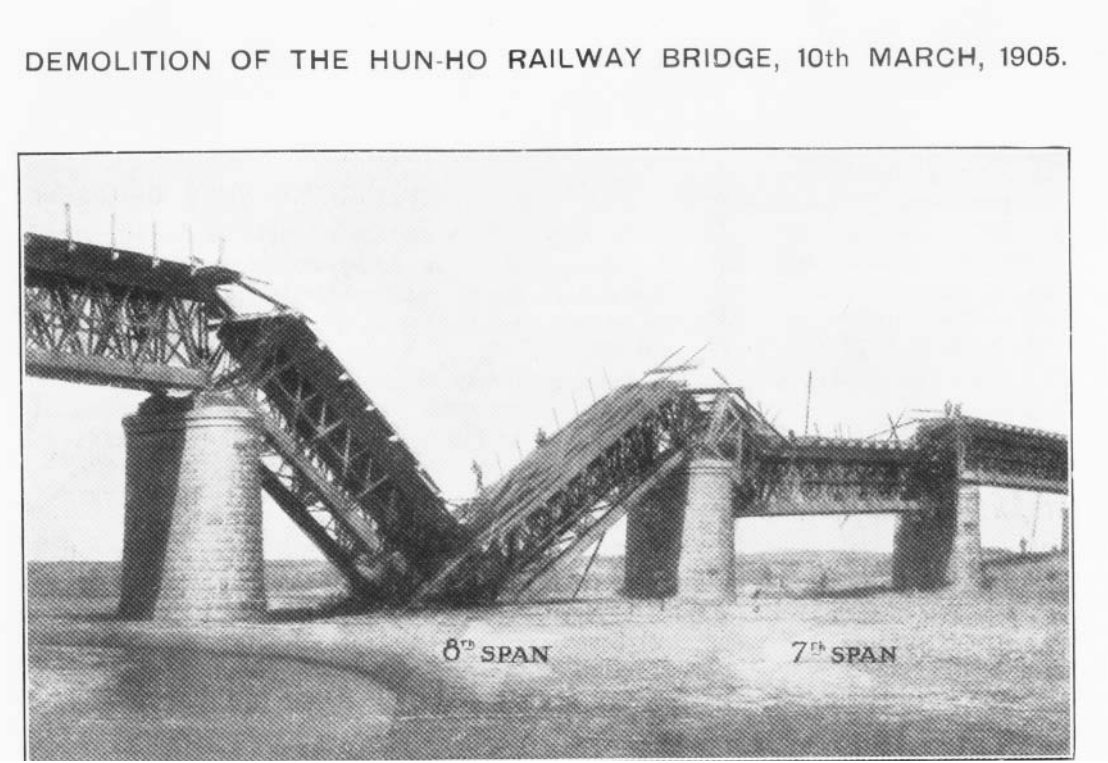
Germany, Austria, Servia, Turkey, the Crimea and Asia Minor, visiting Malta, Tunis, and Algeria on his return journey.

On the 28th July, 1891, he married at Brighton, as his second wife, Charlotte Sophia Mary Penrose Coode, only child of the late Major Penrose Coode, Royal Marine Light Infantry, and grand-daughter of the late Admiral Sir John Coode, K.C.B. He then settled in London, first at Oxford and Cambridge Mansions, and later at Nevern Mansions, Earl's Court.

In 1891 General James's aunt, Miss Annabella James, died, and he came into possession of many books, manuscripts, portraits, miniatures, and other family relics. He always stayed at home in the morning and spent a great deal of his time in arranging these papers, in compiling pedigrees and histories of his ancestors and his own autobiography in many typewritten and illustrated volumes. In 1898 he printed a volume entitled *The James Family* for private circulation.

He was a member of the Army and Navy Club from 1856. He was elected a Fellow of the Huguenot Society of London in 1899. He was also a member of the Russian Society and read a paper on his Russian travels. He was a very regular attendant at the Corps Meetings and dinners and kept up his interest in Corps matters, serving on the Institute Council and contributing to the *Royal Engineers Journal.*

He died after a short illness at his flat in Nevern Mansions on the 14th October, 1909, and was buried in Brompton Cemetery on the 16th October. His wife was very ill at the time of his death. She died on the 29th November following and was buried beside him. Major-General James's only child, Miss Eleanor Amie James, survives him.



THE HUN-HO RAILWAY BRIDGE

TRANSCRIPT.

THE DEMOLITION OF THE HUN-HO RAILWAY BRIDGE.

Précis of an account by Capt. Zavadski, 4th Railway Battalion, published in the *Razvyedchik*, No. 1023, 1910.

VARIOUS contradictory accounts of the demolition of the Hun-Ho railway bridge have been circulated. The following is a description of what actually took place.

On the 9th March, 1905, I was detailed with my mounted sapper detachment of the 1st Siberian Army Corps, by the Chief of the Traffic Section of the Commander-in-Chief's Staff, to demolish the railway bridge which crosses the Hun-Ho River 4½ miles south of Mukden. Lieut.-Colonel Kolobov, commanding the 2nd Trans-Amur Railway Battalion, was ordered to superintend the operation.

About 8 p.m. on the 9th March, I reported myself to Lieut.-Colonel Kolobov. I had with me 1st Class Conductor Chebotarev and a senior non-commissioned officer of the 1st East Siberian Sapper Battalion. Colonel Kolobov pointed out on a sketch the proper place for laying charges of pyroxylin, on a cross section of a girder. The bridge consisted of 22 bays, with girders each 135′ long. It was impossible to demolish the piers of the bridge, because no mine recesses existed and it would have taken too long to construct them.

Colonel Kolobov ordered me to proceed with my detachment at once to the bridge, and wait there until he arrived in a trolly. I reached the bridge about 9 p.m. After I had been there for about half an hour, Lieut. Terletski, attached to the 5th East Siberian Sapper Battalion came up with three men. He told me that he had been sent by the Officer Commanding Engineers, 5th Siberian Army Corps, to demolish the bridge. I told him that I was waiting for Colonel Kolobov who was to superintend the operation. The latter arrived with two officers and some men of the Trans-Amur Railway Brigade, in two trollies, about 10 p.m. He ordered us to remove the flooring and also the rails over the 8th and 10th spans; I was ordered to prepare the 8th span for demolition and Lieut. Terletski the 10th span from the northern end of the bridge. I set my party (3 non-commissioned officers and 3 men) to work upon the 8th span, and Lieut. Terletski with his three men went off to the 10th span.

At 3 o'clock in the morning, Colonel Kolobov told me that he had to return to Mukden, and went off with his staff in his trolly. He ordered me to wait, when I had finished my own work on the 8th girder, until Lieut. Terletski was ready with the 10th.

About 5 a.m. on 10th March my 8th girder was ready; all six charges

were attached in position with Bickford fuzes, joined together at the two ends, on both sides of the girder. Lieut. Mennik, of the 17th Sapper Battalion, then arrived with three men and told me that he had been ordered to demolish the bridge. As there was little time available for preparing an explosion along the cross section of the girder, and the Japanese might appear at any moment, he decided to blow up the 7th girder by placing two cases of pyroxylin on the ends of the upper members of the girders close to the point where the girder rests on the stone pier. His work was soon finished, and he and I both waited over two hours for the work on the 10th girder to be finished.

At 8 a.m. an officer of the Ural Cossack Regiment came up with a patrol and warned us to make haste in blowing up the bridge, as his patrol would be the last to cross it, while the Japanese might arrive at any moment from Fuliu to the eastward where they had forded the river. I went to Lieut. Terletski and asked him when he would finish his work, told him that I should blow up my own bay as soon as any Japanese appeared, and begged him to hurry up.

At 9 a.m. he at last said that he was ready. Cables were then run from the 10th and 7th girders to the northern end of the bridge, and Bickford fuzes from the 8th girder were lighted, on my order, by my two senior non-commissioned officers.

I watched the results of the explosion from close to the end of the bridge. The first explosion was that of the 7th span which was fired electrically. There was a yellow column of dust, and the far end of the girder, which bent at the point of the explosion, slipped from the pier. Four minutes later, the six charges placed by my own men in the 8th span blew up almost simultaneously. The centre of the girder was cut through and the two broken ends fell to the ground in the middle of the span. The charge affixed to the 10th girder by Lieut. Terletski did not explode at all.

Having successfully accomplished our work, I took my party at a trot to Mukden station, where my Sapper Company (180 men, of the 1st Siberian Army Corps) had meanwhile made all necessary preparations for setting fire to the adjacent stores and magazines. After ordering these to be set alight I withdrew my force and left the N.E. side of Mukden about 11 a.m. and, after passing various troops halted on the crowded road, we reached the main Mandarin Road. Near the village of Tava, the Japanese surrounded our troops and opened artillery fire upon them. I managed to get my party through, together with our transport. During our further retreat northwards, we were under Japanese artillery fire for some 10 miles, and my force lost 2 men killed and 3 wounded.

I am indebted to the Russian Military Attaché in Japan for the following statement received from the Japanese General Staff as to the conditions in which the bridge was found by the Japanese.

"The bridge had been demolished on the 10th March, 1905, by the Russians. Its appearance is shown by the photograph annexed. As it was impossible to repair the bridge within any reasonably short time a temporary bridge was constructed with great difficulty further up the river, over which rails were laid . . . "

NOTICES OF MAGAZINES.

Revue Militaire des Armées Étrangères.

August, 1910.

Military News of Different Countries.—*Austria.*—Capt. Frederick Boemches of the 5th Battalion of Austrian Pioneers has recently invented a dirigible. Its capacity is 2,750 cubic metres, and its length 57 metres. It is divided into four compartments each of which has its own safety valve and ballonet, the object of this arrangement being to avoid catastrophes similar to those of the "République." In the foremost of its two cars is the machinery, and in it travel two mechanics and the pilot. In the rear car is room for four passengers. The engines consist of two 36-H.P. twin cylinder motors; the diameter of the two propellers is 34 metres, and the maximum speed attained 55 kilometres per hour. Official trials are to take place in the autumn.

A knowledge of shorthand is now necessary for admission to the Austrian Staff College.

Belgium.—Reorganization of the Artillery.—The new organization of the artillery is as follows:—Field Artillery.—Consists of 4 brigades of 2 regiments each. A regiment is composed of headquarters, 6 batteries, organized in two groups of 3 batteries, and in the case of odd-numbered regiments, 2 reserve batteries and a depôt; in the case of even-numbered regiments, 1 reserve battery and an ammunition column. The strength of the battery is 84 men and 47 horses. Horse Artillery.—Two groups of 2 batteries each. The strength of a battery is 109 men, and 59 riding and 38 draught horses. All the batteries have 6 guns.

Italy.—A special grant of 10 million francs has been voted by the Italian Parliament for the year 1909—1910 to pay for:—(1). The construction of dirigibles, aeroplanes, hangars and other necessary accessories. (2). To cover the expenses involved by sending officers on tour to examine other balloon installations, on free runs, etc.

Japan.—1,200,000 francs have been voted for aeronautical experiments, part of which is to be devoted to the purchase of a suitable ground to carry out the experiments on. The army and navy both contribute officers to this experimental work.

Roumania.—The army is being reorganized, and the following is its new organization:—Infantry.—Consists of 36 regiments each of 3 battalions and 1 depôt company. There are 4 companies in each infantry or rifle battalion. Cavalry.—Each regiment consists of 4 squadrons and 1 depôt. 6 machine gun sections of 2 guns apiece

have been allotted to the cavalry. Artillery.—18 regiments arranged in 9 brigades of 4 batteries, a "cadre" battery, and in some cases a howitzer and 3 depôt batteries compose a regiment. Pioneers.—6 battalions (5 field and 1 fortress) each consisting of 3 companies and a reserve section. Troops of Communication.—1 pioneer and 1 railway battalion of 4 companies each and 1 depôt company. There is also a specialist company for wireless telegraphy, searchlights, motor cars, carrier pigeons, and a section of airmen.

A. H. SCOTT.

RIVISTA DI ARTIGLIERIA E GENIO.

July—August, 1910.

THE WORK OF THE RUSSIAN SAPPERS AT THE DEFENCE OF PORT ARTHUR.—The *Mitteilungen über Gegenstände des Artillerie-und Geniewesens* publishes a recent account by Capt. W. Iakowlew of the works executed by the Russian sappers during the defence of Port Arthur.

This article published at the end of last year in the *Ingenernij Journal* contains notes of much importance which the author has collected from official sources during the campaign.

At the time of the investment (30th July, 1904) the following technical troops formed part of the garrison of Port Arthur:—1 company of sappers, of 420 men; 1 company of fortress miners, of 206 men; 1 company for railways, 340 men; 1 detachment of telegraphists, 88 men. During the investment the work of the sap and the underground mines was executed by the sappers and railway men.

The lines of defence of the fortress, as regards technical works, were divided into six sections, to each of which a superior officer of engineers was appointed. The men of the sapper company were distributed among the various works of the fortress.

As is known, the principal lines of defence of Port Arthur extended for about 23 k.m. comprising six permanent forts, five provisional works, five batteries distinguished by the letters A, B, D, G and W, and some redoubts and field entrenchments.

Port Arthur had three fronts of land defences; the eastern front from the Bay of Tach up to the Lunch Valley; the front along the Lunch Valley; and the west front from the Lunch Valley to the Bay of Iaaben.

On the eastern front—about 8 k.m.—on which the Japanese made their principal attack, there were the following works:—No. I. Fort, Batteries A and B, Forts Nos. II. and III., and the work *e*. In the intervals between these works, field redoubts, batteries and trenches were constructed. On the other side between Forts II. and III. there were two old Chinese works with high ramparts, without ditches, one of a pentagonal trace, and the other with four sides. These works were in a ruinous state and had to be reconstructed by the Russians and were numbered 1 and 2. Redoubt No. 1 was particularly efficient as a support on the

right of Fort III. In rear of No. 2 there were two batteries, one called the rear battery with 3 guns of 15 c.m., and the other with 4 mortars of 23 c.m. Behind the Redoubt No. 1 there was the battery called the Eagle's Nest.

On the 19th August the Japanese had captured the ground in front of Daguschan, Sjaoguschan and Echberg. On the same day they commenced the bombardment on the eastern front and especially of the interval between Forts II. and III. On the evening of the following day the Japanese were massed in the spaces of ground before Nos. 1 and 2.

On the morning of the 21st August they commenced a series of attacks against Redoubts 1 and 2. Notwithstanding the obstinate defence of the Russians the redoubts fell into the hands of the Japanese on the evening of the 22nd August.

On the night of the 23rd—24th August the Japanese renewed their attack on the eastern front. Although received with an intense fire by the Russians, they succeeded in gaining a portion of the wall which had been ruined by the bombardment near to its bifurcation towards Redoubt No. 1.

From this point the Japanese again advanced to the attack of the rear battery and the Eagle's Nest, but were repulsed with enormous losses in a counter-attack by the Russians from the Chinese walls. In the small space of about 400 m. between the Chinese walls and the rear battery about 2,500 Japanese corpses were counted on the following night. This place was called "the valley of death" in consequence.

The Russians having failed to recapture the lost redoubts, the commandant of the fortress gave orders to proceed against the middle ones by methodical attack by sap and mine.

On the evening of the 31st August they commenced the approaches against Redoubt No. 1, but the work had to be stopped owing to the insupportable stench from the Japanese corpses which rendered the work impossible.

On the 10th September, mining work was commenced but the work proceeded very slowly. A depth of 3·55 metres was gained. Regular ventilating apparatus not being available, a marine pump had to be used.

On the morning of the 17th September the gallery had only reached 16′ (4·88 m.) in length, and those working in it began to hear the work of the Japanese countermines. The advance of the Russian gallery proceeded up to the 21st September at the rate of 8·5′ (2·60 m.) a day; on the following days owing to frequent alarms, this rate was considerably less, varying from (0·76 to 2·14 m.). The Japanese now constructed approaches, and mounted additional guns.

On the morning of the 5th October, the Russian gallery had gained a length of 42·50 m. and on the 10th October two lateral branches were excavated, in length 2′ on the left and 10′ on the right. At this point the work had to be suspended on account of the ever-increasing density of the rock.

This fatiguing work, lasting for a month and a-half, comprised the construction of about 70 metres of mining galleries; 235 m. of

approaches; and 30 traverses; and employed the services of the only company of sappers available at Port Arthur; and a company of railway men who were unable to recapture the redoubt owing to the enforced suspension of work in the mines.

In front of Redoubt No. 1, two mines, Nos. I. and II., were placed at the extremities of two lateral branches, and a third, No. III., in the gallery at two-thirds of its length from the entrance. The charges were calculated at the following proportions:—No. I., 187·3 lbs.; No. II., 412·5 lbs. and for mine No. III., a charge of 548 lbs.

At the point of the gallery in front of Redoubt No. 2, two charges were placed, one of 720 lbs. and the other 540 lbs. There were besides several groups of fougasses. By the middle of October the mines and the fougasses were ready for explosion. On the 16th October the Japanese captured one of the caponiers, and the second one was captured on the 30th October.

On the night of the 25th—26th November the Japanese after some tentative failures succeeded in destroying one of the obstacles by means of explosives.

On the morning of the 26th November a violent bombardment with shells of 28 c.m. commenced against the Chinese walls, and about midday the Japanese proceeded to the assault. When the first column of about 100 men followed by a second of the same strength, reached the fougasses in front of Redoubt No. 2 they were exploded simultaneously with mines Nos. I. and II. The explosions caused heavy losses among the Japanese, but a fresh assaulting column succeeded in capturing the trenches in less than half an hour. Towards evening they returned to the attack of Redoubt No. 1, and even though the Russians exploded the mines Nos. II. and III., and the group of fougasses No. 1, they finally succeeded in capturing the lunette Kaido.

Of the five mines and the ten groups of fougasses in front of the two redoubts, only two groups of fougasses could not be exploded as they had been damaged by the bombardment. These mines and fougasses caused great losses to the enemy, delaying his advance and at some points compelling him to retire and to change the direction of attack.

EDWARD T. THACKERAY.

RECENT PUBLICATIONS OF MILITARY INTEREST.

OCTOBER, 1910.

(*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.

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*PART II.**

SECTION I.

FORTIFICATION AND MILITARY ENGINEERING.

PONTOON REGULATIONS (Pontonier Vorschrift), 17th May, 1910. Official. 214 pp., and numerous diagrams in text. 8vo. Berlin, 1910. Mittler. 1s. 6d.

These Regulations supersede those dated September, 1902, and deal with the new pontoon equipment.

The Germans have taken a hint from the British Regulations and have marked the portions of the book which are new with a thick black line in the margin. The most important innovation is the construction of a bridge with half-pontoons.

Pontoons are now classed as "whole" pontoons and "half" pontoons (*Ganz- und Halbpontons*). They are made of galvanized steel. The "whole" pontoons are rounded off at the stern and have a poop at the bow end 0·25 m. (0·72′) high and 1·5 m. (4·2′) long, tapering to nothing towards the stern. They are 8 m. (26·2′) long over all, 1·5 m. (4·2′) broad, with a freeboard of 0·85 m. (2·7′). The weight is about 500 k.g. (1,102 lbs.). The half-pontoons are each 4·50 m. (14·7′) long, 1·4 m. (4·5′) broad, with a freeboard of 0·85 m. (2·7′). The weight of a bow end is 300 k.g. (661 lbs.) and of a stern end, 310 k.g. (663 lbs.). The buoyancy of the two half-pontoons put together is the same as that of the "whole" pontoon.

HISTORICAL.

SKETCHES OF MANCHURIAN BATTLEFIELDS. By Major A. I. R. Glasfurd, I.A.

This book of panoramic sketches drawn on the battlefields of Manchuria is a valuable addition to the existing literature on the Russo-Japanese War. The presentment of the ground is accurate and realistic, and the relative values of the various tactical points are graphically demonstrated.

The letterpress accompanying the sketches is simply a statement of such characteristics of the ground as cannot be shown in the pictures.

* The titles of all books are given in English; this does not indicate that the books have been translated. The original title in the language in which a work is written, if not in English, is given in brackets.

HOOD'S TEXAS BRIGADE. By J. B. Polley. 347 pp. 8vo. Illustrated. New York and Washington, 1910. The Neale Publishing Co. 16s.

Of the Texas Brigade a Librarian of Congress wrote, "the known statistics of these regiments are so remarkable that if missing figures can be obtained it will establish a record equalled by few, if any, organizations in the Civil War, or indeed in modern warfare," and Hood, its first real commander, says "its signal achievements in the war of secession have never been surpassed in the history of nations." The author, who served as a private in the Fourth Texas, shows that this claim is well founded.

The nucleus of this famous brigade consisted of the First, Fourth, and Fifth Texas regiments of infantry, which at the end of 1861 were formed into a brigade in conjunction with the Eighteenth Georgia regiment under the command of Brigadier-General Wigfall. Early in the following year Wigfall was succeeded in command by Brigadier-General J. B. Hood, who till then had been colonel of the Fourth Texas. Under his command the brigade received its baptism of fire on the 7th May at Eltham's Landing, where it was engaged with part of Franklin's division, but the encounter did not rise above the dignity of a skirmish. After this it was strengthened by the addition of the infantry of Hampton's Legion, but took no active part in the Battle of Seven Pines. In June it was sent with Whiting's brigade to the Shenandoah Valley to reinforce "Stonewall" Jackson. It formed part of his command during the Seven Days' fighting round Richmond, and made its name in the Battle of Gaines' Mill where it was the first to break Porter's lines. The honours of the day were won by the Fourth Texas, which captured 14 guns; and the Fifth Texas distinguished itself by the capture of a whole Federal regiment. The total loss of the brigade in this battle was 128 killed and 428 wounded. The claim advanced 12 years ago that it was Pickett's brigade which captured the Federal artillery is examined and rejected by the author, for reasons which seem entirely convincing.

After the relief of Richmond, Whiting's and the Texas Brigades were restored to Longstreet's command, and formed a division temporarily under Hood's command, who still retained the command of his original brigade. In the Battles of Second Manassas and Sharpsburg the Texas Brigade bore a most distinguished part. The 30th August was the day of the Fifth Texas, which, after almost annihilating its old enemy the Fifth New York Zouaves, "slipped the bridle," pursued the retreating Federals to the Chinn House, and assisted in dislodging them from that strong position. But the lack of a proper brigade commander caused the regiments to become widely separated, and somewhat impaired the efficiency of the brigade as a unit. In the Maryland Campaign the brigade was commanded by Colonel Wofford of the Eighteenth Georgia. The brunt of the fighting on the 17th September was borne by the Fifth Texas, which going into action 226 strong lost 45 killed and 141 wounded, whilst the loss of the whole brigade in that battle was 560 out of 854 men engaged.

On the reorganization of Lee's army in October, 1862, Hood was promoted Major-General and given command of a division composed of the Texas and three other brigades. The Eighteenth Georgia and Hampton's Legion were transferred to other brigades; and in their place the Third Arkansas was attached to the Texas Brigade, which was now placed under the command of Brigadier-General J. B. Robertson, late colonel of the Fifth Texas, but it continued to be known throughout the war by the name of Hood's Texans. It took no active part at Fredericksburg, and missed Chancellorsville. In the Gettysburg campaign it was heavily engaged on the second day in the historic struggle in Devil's Den, and lost 87 killed and 329 wounded. Though no great admirer of Longstreet, the author is plainly disposed to acquit him of the charge of having caused the loss of the battle. He takes the view that Lee's plan of attack was not made known to Longstreet till nearly noon of the 2nd July, owing to the delay of the officers sent by Lee at daybreak to reconnoitre the ground, for whose report he was impatiently waiting: that Longstreet's movement was delayed, not owing to the Corps Commander waiting for the arrival of Law's brigade, but because Anderson's division of the Third Corps did not get into position till 1 p.m., and it was not till this division was in line of battle that Lee sent General Pendleton to conduct Longstreet's command to its position. "Of whatever needless delay, slow and deliberate movement, and unwillingness to give battle General Longstreet may be accused and may have been guilty, there was yet abundance

of time after the divisions of Hood and McLaws went into action, in which, by united effort, to drive the Union Army from its stronghold and put it to rout.'

In September, 1863, Hood's division was sent to reinforce Bragg in Tennessee, and took part in the Battle of Chickamanga. The author makes some interesting observations about the difference in fighting methods between the armies of the West and East. Both Rosecrans' and Bragg's armies were accustomed to "stand up and fire" and "lie down and shoot" fights, but were unaccustomed to "the wild charges so common in Virginia." The brigade was next engaged on the 20th October in the night attack made by Hood's division, now under General Jenkins' command, upon Hooker's force at Wanhatchie. The Texans resented the appointment of Jenkins over the head of Law; and the veteran troops of the division were unwilling to engage in a night attack. Of the Texas Brigade only the Fourth Texas was in the firing line, and its headlong stampede from Raccoon Mountain is humorously described by one of the participants. When Longstreet was given discretionary authority in December over all the Confederate forces in East Tennessee, he seized the opportunity to rid himself of some of his subordinates. At his instance Jenkins preferred charges against General Robertson, and though these were very properly quashed by the President and the Secretary of War, Robertson, rather than remain under Jenkins' orders, resigned his command and was succeeded by Brigadier-General Gregg. In the Wilderness Campaign the Texas Brigade came up just in time to stop the rout of Wilcox's and Heth's divisions, and to drive back Hancock's pursuing troops. At Spottsylvania it was almost surprised on the evening of the 10th May by Upton's assault, but took no part in the desperate fighting at the "Bloody Angle" on the 12th May. Nor was it directly attacked at Cold Harbour on the 3rd June, although it contributed to the repulse of the Federal attack by pouring in a heavy fire upon their left flank. The brigade was relieved from duty in the Petersburg lines just before the explosion of the Burnside mine, and sent to the north bank of the James River, where it remained till the evacuation of Richmond, taking a prominent part in the engagements of the 29th September and the 27th October. General Gregg was killed during a reconnaissance in force on the 17th October, when the brigade lost more heavily than in any engagement since the Wilderness. He was the last officer holding the rank of Brigadier-General that commanded the Texas Brigade. The brigade when it surrendered at Appomattox numbered 557 officers and men.

A Short History of Burma. By S. W. Cocks. 229 pp., with 1 map, an introduction, index and chronological table of chief events. 8vo. London, 1910. Macmillan. 2s.

This little book gives the history of Burma in a concise tabulated form, commencing with the prehistoric period and early traditions and closes with the Annexation of Upper Burma on the 1st January, 1886. The two final chapters deal with Arakan and its population, and society and government under the Alaungpaya dynasty, of which King Thibaw was the last representative.

Marshal Berthier's Reports to the Emperor during the Campaign of 1813 (Rapports du Maréchal Berthier à l'empereur pendant la campagne de 1813). By X. 2 vols. 510 pp. and 423 pp. 8vo. Paris, 1909. Chapelot. 16s.

These volumes contain all the reports made to the Emperor by his Chief of Staff during the period 15th March to 31st December, 1813. Some of the documents are merely "covering minutes" transmitting the reports of subordinate officers and are of little interest, while others which exhibit the distribution of troops at different periods are of considerable historical value. The majority deal with purely routine matters placed before the Emperor for his decision, and they provoke amazement that it was possible for him to achieve success in war and govern half Europe when he must have been obliged by his centralized method of staff work to devote many hours and days to office papers. There are reports referring to him for decision appointments on the staffs of subordinate

generals, regimental promotions, recommendations for the Legion of Honour and hundreds of minor matters which might well have been settled by a man of Berthier's rank.

The following are specimens of the reports :—

(*a*). "Sire, the Prince de la Moskova requests :

(1) that Capt. Valicon of the 144th Infantry Regiment shall be transferred to the *Sapeurs ;*
(2) that Capt. Peradi of the 136th should become *adjudant de place.*

"He requests at the same time authority to send a lieutenant and a second lieutenant of the 145th to France for recruiting purposes.

"I have the honour to propose to your Majesty to authorize me to give the necessary orders for the execution of these different matters."

(*b*). "Marshal the Duke of Castiglione presents as likely to become a good second lieutenant, Mr. Ellena, ex-sergeant of the 67th, discharged in 1811 after three years' service on account of wounds.

"Mr. Ellena has recovered from his wounds and requests to rejoin the army; he is 20 years of age.

"If your Majesty is pleased to grant him the rank of second lieutenant, he can be placed in the 7th Infantry Regiment, XIIth Army Corps."

(*c*). "I have the honour to place before your Majesty a letter of General Bruyère in which he requests the decoration of the Legion of Honour for Lieut. Nypels, 7th Hussars. This officer has been previously recommended by General Bruyère."

(*d*). "Sire, your Majesty has not yet given me orders for the Treasury Chest, which is escorted by the 4th Battalion of the 37th Light Infantry, and ought to arrive at Erfurt this evening, there to attend further orders : I request orders for the 37th if the Chest remains at Erfurt."

(*e*). "I have the honour to place before your Majesty a letter that I have received from Count Durosnel in which he reports the request of General Gersdorf for authority to withdraw four 12-pr. and four 6-pr. guns, forming part of the armament of Dresden and Neustadt ; these guns are required by the Saxon Artillery, which is about to take the field."

Some of the reports are merely marked "Approved. Napoleon"; but others contain detailed directions; the last for instance is minuted "Approved. Replace them by some siege pieces which can be taken from Torgau or Koenigstein. Dresden, 29th June. Napoleon."

THE TRIAL UNDER FIRE OF THE RUSSIAN ARMY IN THE WAR OF 1904–05 (Die Feuerprobe der Russischen Armee in Kriege 1904–05). By Richard Ullrich, Lieutenant in the Reserve of the German Army. 262 pp., with 29 illustrations and 8 plans. 8vo. Berlin, 1910. R. Eisenschmidt. 7s. 3d.

Seldom has a more instructive and fascinating book than this been published about a campaign. The author had to leave the German Army after some seven years' service, on medical grounds, just before the Manchurian War. He had previously mastered the Russian language and established friendly relations with many Russian officers, including General Orlov. When this officer obtained command of the 3rd Division (XVII. Army Corps), Ullrich received permission to join his headquarters as a guest. He arrived shortly before the Battle of Hei-kou-tai, took part in this action, and in the Battle of Mukden, and in the retreat on Tieh-ling. During the summer of 1905 he was attached to General Rennenkampf's Corps on the east of the Russian battle front. He also visited Vladivostok.

The author claims to be an impartial though candid critic of the Tzar's forces, but his story, which bears throughout the impress of the expert eye-witness, leaves a most unfavourable impression of the Russian Army. For the military reader the interest of

the book is twofold:—It proves the supreme *importance of moral*, and it contains details of tactics, engineering, administration, etc., which are of value as coming from a professional soldier and free-spoken narrator.

Whilst praising the bravery of the officers and men of a heavy battery and of some infantry at Mukden, as well as of Rennenkampf's dismounted Cossacks, he passes severe strictures on the cowardice, drunkenness and luxury of many generals and officers and declares the high estimate in which the Russian soldier is held to be unjustifiable. General Rennenkampf, however, is repeatedly cited as a brave man and good disciplinarian. Of the Russian soldier the author says that his character is too dependent for present-day fighting, and accordingly he lays emphasis on the special importance of personality amongst leaders in the Russian Army. He draws a vivid picture of indiscipline and panics after Mukden, but praises the conduct of several units, especially the mounted scouts, in this battle, and declares that the charge of advancing in unduly dense formations to be groundless as far as the infantry at Mukden were concerned. The staff officers according to him were too theoretical, and many, appointed on account of family influence, were grossly incompetent. The infantry officers he found listless and lethargic, whilst throughout the commissioned ranks bitter personal animosities, self-seeking and medal-hunting were rampant. Whilst defending those at the front against the charge of luxurious living, he portrays in lurid colours the rioting and debauchery that went on behind, and the outrageous ill-treatment of the harmless Chinese. From this the author draws a moral: "Be strong," he says, "for, whilst man remains what he is, the weak will be trampled on."

Very interesting are the details about artillery fire; the author was favourably impressed with the fire-control system but not with the tactics. Shrapnel fire appears to have given poor results on the whole, but the moral and material effect of Japanese 11" shells was great.

The medical organization appears to have been fairly good, though the insanitary camps and filthy habits of officers and men are several times mentioned. Enthusiastic encomiums are passed on the Russian field kitchens. Two instances are given of criminally careless work by reconnoitring officers; their shirking methods and garbled reports had far-reaching results at Mukden. He blames the Japanese for lack of enterprise after Mukden and declares that they could then have captured and destroyed a great part of the Russian Army and imposed their own terms of peace. The Japanese higher leading on the whole, and their infantry tactics come in for warm praise. Descriptions, with rough sketches, are given of Russian trenches and head-cover, the respective merits of various types being discussed. Wire entanglements are criticized as disclosing positions, besides being easily destroyed by artillery. The author prefers trip wires, of which he gives a sketch. Many useful hints are given on intelligence duties; and the value of close reconnaissance before attack is illustrated by Japanese and Russian procedure, especially the former.

Of machine guns he says that at short ranges and in pursuit they effect more than artillery, but they are of little use against troops who are sheltered by banks or buildings. Strong emplacements should be made for machine guns, and artillery should not grudge ammunition in its attempt to put these weapons out of action. Machine guns should be controlled by the divisional commander, supervised by a specially trained officer, and allotted to regiments as required.

Good glasses are a *sine qud non* for all officers of an army, and the enemy's tactics must be carefully studied so as to draw correct inferences from what is seen.

Digging in the attack, he says, provides some cover, and a rest for the rifle; it also hides from view, and consequently the enemy's reinforcements will not know where to aim.

The general moral of the book is: Character is more important for leaders than attainments, although sound study is a necessary preliminary; in tactics the form matters less than adaptation of means and methods to the needs of the moment. Strict discipline is essential.

The well-known military writer, Colonel Balck, contributes an introduction.

POLITICAL.

THE NATIVE STATES OF INDIA. By Sir William Lee-Warner, K.C.S.I. 496 pp. and index. 8vo. London, 1910. Macmillan. 10s.

This valuable addition to the literature on British India is a work of more than passing interest. The relations of the Native States of India to the Supreme Government present a problem of unusual complexity, and it can be easily understood that the feeling between the Government of India and the hereditary rulers and nobles of the Native States has a vast influence on our policy in India. Hence, a study of the question cannot fail to be of interest, and this particular book with all the wealth of detail and information imparted by Sir William Lee-Warner, is one that will be read by all students of the subject.

THE POSITION OF FRANCE WITH REGARD TO GERMAN EXPANSION (L'expansion de l'Allemagne et la France). By Henry Andrillon. 298 pp. 8vo. Angoulême, 1909. Imprimerie Militaire L. Coquemard.

This is an interesting study. The author regards the expansion of the German Empire as the greatest danger to Europe at the present time, and draws a graphic picture of the superiority of Germany to her neighbours. He shows that Germans look upon France and Great Britain as decaying races and degenerate nations, who have passed the zenith of their power and are now on the downward path. He does not, however, himself believe this to be the case, but says that Frenchmen at any rate only require to be aroused from their lethargy and to be made to realize their danger before it is too late. He gives a detailed description of German education and intellectual thought, and shows how much of Germany's success is due to her schoolmasters and professors. The Germans instil patriotism, sense of duty and loyalty into their children, whilst this important duty is neglected, nay even forbidden, in France and Great Britain.

STRATEGICAL AND TACTICAL.

THE RUSSO-JAPANESE WAR. Lectures given at the Russian Staff College. Translated from the Russian, Parts VII., VIII., IX. (Conférences sur la guerre Russo-Japonaise faites à l'Académie d'état-major Nicolas. Traduit du Russe, Fascicules 7, 8 et 9).

Part VII.—"A strategic sketch of the offensive action by the IInd Manchurian Army in January, 1905." General Mishchenko's Mounted Detachment during the offensive action of the IInd Army in January, 1905. 209 pp., including 4 appendices, 12 sketch maps. 8vo. Paris, 1909. Henri Charles. 4s. 2d.

Part VIII.—"The Battle of Mukden." 446 pp., including 16 annexures. Table of contents, plans and annexures. 16 plans at the end of the book. 2 appendices (orders of battle of Russian and Japanese Armies). 8vo. Paris, 1909. Henri Charles. 8s. 4d.

Part IX.—588 pp., with 4 maps and Table of contents. 8vo. Paris, 1910. Lavauzelle. 8s. 4d.

HOW TO SOLVE A TACTICAL PROBLEM (Comment on résout un thème tactique). By Commandant Savatier, of the French Army. 216 pp. 8vo. Second edition. Paris, 1910. Charles-Lavauzelle. 3s. 4d.

In a preface the author warns students against striving to solve tactical problems in conformity with certain fashionable ideas; each solution should be justified by a careful

logical reasoning and based upon common sense; but, he says, a knowledge of certain principles is a necessary preliminary.

The book consists of two parts. In Part I. solutions are discussed in detail, but no orders are written. In Part II. orders and instructions are given in each case. Throughout the book the French predilection for strategic advanced guards and distribution in depth is evident. The following principles evolved will be of interest to students of tactics:—

Advanced Guards. When a large unit advances in several columns one tactical advanced guard only should be formed, so as to ensure unity of direction. The other columns merely throw out small advanced guards ("de *sûreté matérielle*").

Even columns following others must throw out advanced guards; and however far back the column, its artillery should always be preceded by some infantry. An advanced guard preparing for action does not necessarily halt except when in presence of manifestly superior forces. On other occasions it continues to advance with caution. Divisional mounted troops must furnish all detached infantry bodies with *personnel* necessary for establishing communication laterally and from front to rear. An advanced guard must hold or attack the enemy; the main body manœuvres. Chapter XII. contains an instructive example of the necessity of a common school of thought amongst leaders: different protective detachments may receive from Headquarters separate tasks but necessitating co-operation; each officer commanding a protective detachment should, on receiving his orders, be able to assume that other commanders will act according to certain principles, and on this assumption he will found his own plan.

Flank Guards. First put "eyes" in the threatened direction; then protective bodies, each with a definite task; economize detachments. Stationary posts are best nearest the enemy. Make support of a flank guard as strong as possible.

Cavalry with small mixed forces is usually divided into (*a*) small reconnoitring parties; (*b*) distant protective detachments; (*c*) close protection: (*b*) should be as strong as possible.

Outposts must always entrench, however short a time they may remain in position. Entrenchments economize men.

Reconnaissances. Send them to certain points, *not* to sweep certain areas. Tell them what points they are to make (each day when they go away for several days), and whence the first report should be sent.

The description of a "centre de renseignements" (compare Cavalry Training, Secs. 146, 147) is interesting. *Personnel* recommended by author:—G.S. officer, three or four motor cyclists or cyclists, some mounted men. All troops must know where it is.

Buildings, villages and hamlets are useful in ordinary fights, but should be avoided in rear-guard actions, as defenders will probably suffer from shell-fire when leaving them.

Marches when near the enemy. Adopt rectangular formation, one side roughly parallel to proposed front of attack. If ground precludes this, form small marching columns.

Defence of posts. Headings for orders:—Task to fulfil; line to be occupied; rallying position (he mentions this in ordinary operation orders); division into sections; distribution of troops, where work has to be carried out, add tabular statement giving site, nature of work, garrison (of a post work or trench), working party, tools required, remarks.

Orders. Always allot a task thus:—Battalion will go to —— object:—To enable artillery to occupy ——. Orders to cavalry and detached bodies form an exception to the above. Telephones are unsuitable for long orders. When time is mentioned he recommends that words in brackets should follow figures, thus:—4.30 (four thirty a.m.). At the foot of an order, distances which orderlies have to traverse should be noted, thus:—By motor cyclist to X (— miles).

Unfortunately the book contains no maps. The majority of problems refer to the Commercy and Bar-le-Duc districts of the French $\frac{1}{50000}$ map (each of above contains four sheets). The problem in Chapter XVII. requires the Sarrebourg N.E. and Sarreguemines S.E. sheets; the last problem, the S.E. and S.W. sheets of Tonnerre. This detracts from the usefulness of this otherwise valuable work for foreign readers.

TRAINING AND EDUCATION.

GENERAL PRINCIPLES FOR THE EMPLOYMENT OF LARGE UNITS IN WAR (Norme generali per l'impiego delle grandi unità di guerra). Italian General Staff. 133 pp., with 5 plates. 12mo. Rome, May, 1910. Voghera. 11d.

This handbook replaces one on the same subject issued in April, 1903, and represents the latest views of the Italian General Staff on the leading of armies containing two or more corps. Grand tactics only are dealt with, the principles of minor tactics being contained in the handbooks of the various arms, and in the official treatises on matches and cavalry exploration.

As mentioned in the preface, the principles here laid down are for the guidance of the higher leaders, but since all the other tactical handbooks are founded upon this one, the book should be carefully read by officers of all ranks.

TRAVEL AND TOPOGRAPHICAL.

LEAVES FROM AN AFGHAN SCRAPBOOK: THE EXPERIENCES OF AN ENGLISH OFFICIAL AND HIS WIFE IN KABUL. By Ernest and Annie Thornton. 218 pp., with an index and numerous illustrations and photographs. 8vo. London, 1910. Murray. 8s.

A lightly written and attractive book which throws some sidelights upon life in Afghanistan and Cabul. Some very interesting incidents are related, not the least of which is the account of how the Amir stopped all talk of a "jehad" against the British during the troubles on the North West Frontier in 1908.

CORRESPONDENCE.

MILITIA POST, MIRANSHAH, TOCHI VALLEY.

DEAR SIR,

With reference to page 5 of the *R.E. Journal* for July, 1910, I am afraid a misunderstanding has occurred. The note was not written by me but by Capt. A. M. Moens, 52nd Sikhs (F.F.), who was at the time second in command of this corps. I merely forwarded it to the A.C.R.E. as he had asked me to send him such a note. I asked Capt. Moens to write it, as he had been a long time in the valley, while I had only come comparatively recently.

I had no idea it was to be brought out *in extenso* or I would have been more careful to leave no doubt about the authorship. I do not wish to take the credit for what I did not write, and hope you will correct the error in your next issue.

Yours faithfully,

D. H. MCNEILE, *Major*,
Comdt., N.W. Militia.

Miranshah, 12th October, 1910.

The Editor, *R.E. Journal.*

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