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The Von Löbell Annual Reports on the Changes and Progress in Military Matters in 1901

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THE VON LÖBELL ANNUAL REPORTS ON THE CHANGES AND PROGRESS IN MILITARY MATTERS IN 1901.

Précis by Lieut.-Colonel E. GUNTER, p.s.c. (late East Lancashire Regt.)

PREFACE.

The XXVIII. Volume of the above publication for 1901 contains 541 pages, less by nearly 100 pages than that for the previous year, the notices of the Boer War in South Africa being omitted, as explained below.

Before giving any account of the contents of this volume, the author in his Preface pays a warm tribute to the honoured name of the founder of this publication, Colonel von LÖBELL, who for many years conducted it, and who died on the 18th October, 1901, near Berlin, at the ripe old age of 85. The Report will however still bear his name. "When, owing to increasing years, he laid down his pen, it might well be with the conviction that his creation had won a foremost place in German military literature, and had indeed come to be recognised as a work of international importance. His upright character, his correct judgment of men and things, and his amiable kindly manners, won for him many friends among the numerous contributors to his military publications. We, his successors, shall best honour his memory by striving to maintain the work at the height to which he raised it, so that it may attain by degrees to even greater perfection, and thus remain a worthy monument to his creative genius."

The Editor has also to deplore the loss of two faithful collaborators, Colonel PANZERHJELM, director of the War-School in Sweden, and of Colonel von GERNETH, of the Bohemian Army, who was the writer of the Report on the Boxer Rebellion in China in last year's volume.

In the present volume the political situation in Central Asia has been especially considered, as in Part I. full reports are given of the Anglo-Indian Army and of the Afghan and Persian Armies. A Report is also given of the United States Army which will be continued each alternated year by year with that of Japan. This necessitated condensing the accounts of the Forces of the smaller European States, and detailed information regarding these will only be given in future every other year.

The considerable increase in the strength of Armies having increased the importance of Communications, Train, etc., a knowledge of the organisation and working of these is indispensable to every educated soldier. The Editor intended adding a special Report on this to the present volume, but at the last moment difficulties prevented this idea being carried out; it will be however, done next year.

The Editor decided that the Report of the Boer War in S. Africa should be discontinued, as the accounts received were meagre and inexact, and the events of the war and its conduct were of but little military interest. They however reserve to themselves the right of concluding the account of this war at a suitable time.

As but few changes of any importance have been made in Part I., ORGANISATION, etc., the translator has curtailed this to give room for the Report on Artillery Progress, Literature, etc.

The English equivalent Garrison Artillery is used in preference to *Fort* Artillery.

For brevity, notes by the Translator are simply marked with his initials.—E. G.

PART I.—ORGANISATION.

AUSTRIA-HUNGARY.

The re-organisation of the Imperial Landwehr, commenced in 1898, is almost completed. It consists of 36 Landwehr Infantry Rifle Regiments and 2 Landesschützen (Frontier Guard Regiments in the Innsbruck Division) distributed among the 9 Landwehr Districts which form Divisions in war. They have all 3 Battalions, excepting that of Zara, which has 4. Total, 115 Landwehr Battalions. 4 Brigade Commands for these Landwehr were formed in Olmütz, Laibach, Jaroslav, and Linz. The Standing Army consists of 15 Army Corps each in its own Territorial District of 2 Divisions. Total, 31 Infantry Divisions and 5 Cavalry Divisions, with Artillery, Engineers, etc., in proportion of the same strength as published in the JOURNAL for November, 1900, p. 1294.

New provisional Infantry Drill and Training Regulations were issued on 1st October, 1901. The gymnastic exercises are cut out, as they are to be issued in a separate volume.

Imperial Manœuvres, which the Emperor personally attended, were held in September in South-Western Hungary, and the passage of the River Drau formed part of the exercises.

Field-firing on a large scale was carried out by the 5th Corps (Head-Quarters, Pressburg) near Veszprim in Hungary, at which experimental practice with some new Q.F. field guns and howitzers was also carried on, aided by observations from war (captive) balloons.

FRANCE.

The territorial regions Army Corps stations and strengths remain almost the same as in 1899.*

The Colonial Army is approaching the strength laid down in the order of the 7th July, 1900 (viz., 3 Infantry Divisions, 6 Brigades of 12 Regiments of 36 Battalions of 144 companies), 1 Field Artillery Brigade of 3 Regiments (12 Field Batteries), and 6 Mountain Batteries and 18 Batteries of Garrison Artillery.

By the decree of the 31st May, 1901, a number of Batteries are permanently attached in peace to Infantry Divisions, the commanders of which have, as a rule, 6 Field Batteries under them. The General Officer Commanding the Artillery of the Corps the Divisions belong to has, as heretofore, the superintendence of their technical training and their shooting practice. This partition of these Batteries among the Divisions was carried out by the 1st August, 1901, excepting in the 9th, 14th, 15th, and 19th Army Corps which were not completed. It had not yet been quite decided what the eventful organisation is to be, but proposals are to be made according to which (the *Military Journal* says) 1 Regiment (4 Batteries) will remain with each Corps as Corps Artillery besides those attached to Divisions, and the number of guns in a battery is to be reduced to 4. But it is not intended to lessen the number of guns in an Army Corps, as it is expected that 200 new Batteries will be formed.

The Engineers have been increased. Of the 7 Regiments of Engineers 5 have 4 Battalions, 2 have 3. The number of companies in each Battalion varies. One has 7, two have 6, one has 5, eleven have 4, and eleven have 3 companies.

Enlistment, etc.—According to newspaper reports, a project has been laid before the Chamber of Deputies, which will considerably alter the terms of service. As a principle, 2 years' personal service with the colours is required of every able-bodied youth. Upon this follows 11 years' service in the Reserve, and this is succeeded by 12 years in the Territorial Army.

Recruits who voluntarily offer themselves for enlistment must have completed their eighteenth year of age.**

The minimum height has hitherto been 5 feet. On 2nd April, however, a ministerial decree lays down that, if otherwise fit for service, a recruit is not to be rejected for not reaching this standard. This will, it is hoped, increase this year's contingent of recruits by 12,000 men.

* See Report for that year published in the JOURNAL for November, 1900, p. 1299.—E. G.

** An interesting account of the training of the French soldier and other details will be found in the JOURNAL for July, 1902, p. 961.—E. G.

The French Colonial Forces.—On 7th January, 1901, the law regulating the Colonial Forces took effect.

There are in the interior 3 Divisions, each of 2 Brigades, each of 2 Régiments, each of 3 Battalions, each of 4 companies and a *cadre complémentaire*, from which latter a fourth Battalion can be formed in emergency. The strength of the companies is 3 officers and 121 men.

There are 5 Régiments permanently stationed in the Colonies—3 in Indo-China and 2 in Madagascar.

2 Battalions are in West Africa, 2 in New Caledonia and Martinique, 1 Battalion (of 2 companies only) in French Guiana, and 1 (2 companies) in Guadeloupe. 1 company in Tahiti.

The Native Colonial troops are :—

1 Régiment (3 Battalions) of Annamite Rifles in Cochin-China.

3 Régiments, 2 of 3 Battalions, 1 of 4 Battalions of Senegal Rifles in the Soudan, Senegal, and Madagascar.

4 Battalions of Senegal Rifles in various stations.

These troops can all be brigaded when required, the Staffs being complete.

The Colonial Artillery of the interior is formed into 3 permanent Régiments, each of 4 Field, 2 Mountain, and 6 Garrison Batteries, and in 5 companies of labourers and 1 of artificers.

In Tonkin there is 1 Artillery Régiment of 2 Field, 4 Mountain, and 2 Garrison Batteries.

In Cochin-China there is 1 Artillery Régiment of 2 Field, 2 Mountain, and 2 Garrison Batteries.

In West Africa there are 6 Mountain and 9 Garrison Batteries.

The Colonial Troops in France are formed into a corps of 3 Divisions under General Duchesne. The 3rd Division is not yet formed. It will be with the headquarters of the Corps in Paris. The other 2 Divisions of 2 Brigades each are at Brest, Cherbourg, Toulon, and Rochefort.

Recruits for the Colonial Army join in November.

New Regulations, Manœuvres, etc. — New Regulations for Field Exercises and Manœuvres, etc., were issued to several Régiments for trial. They are up to modern tactical requirements and state that preparation for war is the sole object of all peace training. In the autumn new provisional regulations for Artillery training were issued, which are necessitated by the introduction of the 75-millimetre Q.F. field gun. The Report speaks well of both these books.

The Autumn Manœuvres, in the presence of the Tsar, gave great satisfaction. The transport of the troops to these by rail was considered a triumph of railway administration. 190 troop-trains were sent off from

4 stations, carrying the troops back to their quarters in 15 hours without disturbing the ordinary traffic.

In June, practice in guarding a railway line was carried out in the departments of Cher and Loire et Cher, the Reservists of the Territorial Army being called out for this purpose and grouped along the line. They were allowed to wear plain clothes, but armed with the 1874 rifle.

Experiments with modern heavy guns with mélinite shell against the old armour-plated forts on the Meuse showed that the latter were not in condition to stand a siege. In October, near Lyons, experimental practice with stretcher bearers was carried out to see how quickly the wounded could be got away from a battle-field and attended to. Practical exercises in sanitary service were also carried out at Paris, Châlons, Rennes, and Clermont-Ferrand.

Exercises in *Supply* were also practised at Châlons and Rheims, corn being purchased, the magazines filled, etc. These were of great use in enabling the civil as well as the supply authorities to judge how they should best act in war.

Military Education.—From 1903 the age of officers going up for the St. Cyr examination is reduced from 21 to 20, with a minimum of 17, as it is considered desirable that the bulk of officers should be younger than at present.

GERMANY.

The general strength of the German Army having been tabulated in brief last year there is no need to repeat them, nor, as stated in the notes to the Preface, will our space admit of tables to the exclusion of other matter.

Five squadrons of Mounted Rifles were formed during the year from men and trained horses selected from Cavalry Regiments.

Five Machine Gun detachments, each of 3 officers, 66 non-commissioned officers and men, were permanently attached to the Guard, and 1st, 2nd, 4th, and 10th Rifle Battalions.

A Board of Medical Advisers, with the Director-General as President, a Vice-President, and 15 members, was constituted to deal with medical and sanitary business.

In Bavaria 3 new Brigade Divisions (6 Field Batteries) were formed from existing Field Batteries and other corps. These now form part of the Divisional Commands. Another company was added to the train, being formed from men of existing Battalions. A Telegraph Company, with a Cavalry Telegraph School was formed from existing Field Engineer Battalions and from the Railway Battalion.

In Saxony 2 new Brigade Divisions (6 Field Batteries) were formed.

The price for remount horses has been raised to £45.

The Report gives a list of the different courses held at the School of Musketry at Spandau-Ruhleben with dates, showing that these are carried on from March to November, that General Officers attend a special course, and all field officers as well as lieutenants and captains, have to attend courses lasting a month. Selected non-commissioned officers also attend, and a special short course for cadets was held in September.

The details of the new Cavalry Telegraph School are also given.

Imperial Manœuvres were held in West Prussia in September, 1901.*

GREAT BRITAIN.

The Report devotes a good deal of space to the British Army, and gives tabular statements showing the total strengths. It mentions the great departure of Mr. Brodrick in forming Army Corps, but says that even the first three exist on paper only. It estimates for a war beyond seas the following available numbers, besides troops that could be temporarily withdrawn from India, as they were during the Boer War, and Colonial troops:—

	Men.
3 Cavalry Brigades - - - - -	7,491
3 Army Corps - - - - -	108,777
Line of Communications - - - - -	4,000
Total - - - - -	120,268

But it allows that these numbers could be considerably increased by the addition of Militia and Volunteers offering their services abroad. It reckons the total force for war within the United Kingdom as under:—

	Men.
A Field Army of 6 Army Corps - - - - -	260,000
Home Garrisons - - - - -	196,000
Volunteers for Defence of London - - - - -	100,000
Total - - - - -	556,000
Unavailable, Invalided, Sick, Untrained Men, etc. - - - - -	120,000
Total, about - - - - -	680,000

The Report notices all the recent changes, especially the formation of a new Colonial Volunteer Corps, with Mounted Infantry, Cyclists, etc., to be raised from Colonists residing in London for the time, and of the "Imperial Yeomanry." It describes the Army Corps system, which,

* A very brief account of these Manœuvres was given in the JOURNAL for May, 1902, p. 716.—E. G.

though the Army Bill passed both Houses of Parliament, is considered by many, it says, hardly likely to be carried out. It mentions the new organisation of the Militia Reserve, and details the arrangements for training the Volunteer Battalions specially selected to take their places in the Army Corps. It gives details of the War Office and Army Medical Corps re-organisation, as well as that of the Artillery, and goes minutely into the recruiting question in Great Britain.

The Report notices the great efforts being made in England to make the training of their men by the officers a real preparation for war, and the abolition of all useless parade movements and mere show.

The writer criticises unfavourably the present state of discipline of the British Army, which, it says, was never very high.* In Aldershot and Shorncliffe murders and military riots on a large scale took place. Conflicts between bodies of troops and attacks upon officers, with not only the *arme blanche* but with ball cartridge, took place, and in October the open insubordination of Yeomanry in regard to their pay, and their disobedience to their officers, were reported and commented on in the press.** This shows how much the spirit of insubordination had increased in the new levies. The authorities only dealt with the most flagrant cases of insubordination by awarding terms of imprisonment of one or two years. The desertion from the Army amounted to 8 per cent. as against 6 per cent. of former years, while that from the Militia reached to 9½ per cent.

The dismissal from their posts of Sir Henry Colville and Sir Redvers Buller is commented upon.

The trials of motor cars and heavy road engines are mentioned, and the reports of Colonel Templer on the war experiments with balloons are briefly mentioned, as also the boat and raft practice at Wouldham on the Medway.

HOLLAND.

The Report gives the war strength of the Netherlands Home Army as under*** :—

	Field Army.								
	Infantry.			Cavalry.		Fd. Artillery.			H. Art.
	Rgts.	Bns.	Cos.	Rgts.	Sqdns	Rgts.	BrDiv	Batt.	Batt.
3 Infantry Divisions...	9	39	111	3	15	3	6	18	2
									F. Co.
									3

* The Boer War and other recent campaigns show that the discipline of the British soldier is of a high standard.—E. G.

** It would be interesting to know what papers the writer gathered this information from.—E. G.

*** A note on the Dutch Colonial Forces, which are distinct, is in the JOURNAL for May, 1902, p. 718.—E. G.

Contributions, which will be duly published in the Journal of the Institution, should be made payable to the Secretary, Royal United Service Institution, Whitehall, S.W. The following sums have been received :—

	£	s.	d.
R.-Adm. H.R.H. The Prince of Wales	10	0	0
Col. F. C. Trench Gascoigne	25	0	0
R.-Adm. W. B. Bridges	20	0	0
Anonymous	20	0	0
J. A. Mullens, Esq.	10	10	0
Lt.-Col. R. W. Inglis	10	10	0
Adm. Sir E. G. Fanshawe	10	0	0
Major R. H. Jary	5	0	0
Capt. W. A. Tollemache	3	3	0
Adm. Sir Erasmus Ommanney	3	3	0
2nd Lieut. C. L. Patton-Bethune	3	3	0
Lt.-Col. R. M. Holden	2	0	0
Lt.-Col. A. Longley	2	0	0
Major C. H. Wyllie	2	0	0
Lieut. C. P. Wilson	2	0	0
Col. C. F. Bell	2	2	0
Commander P. Nelson-Ward, R.N.	2	2	0
Capt. N. A. H. Budd	2	2	0
Commander W. F. Caborne, R.N.R.	1	1	0
Lieut. B. E. Sargeant	1	1	0
Major C. J. Davenport	1	1	0
Major J. F. A. McNair	1	1	0
Lieut. A. H. De Kantzow, R.N.	1	1	0
Major A. E. Bingham	1	1	0
Commander A. de C. Crawford, R.N.	1	1	0
Col. C. E. Bates	1	1	0
Lieut. G. R. Maltby, R.N.	1	1	0
Major-Gen. J. B. Sterling	1	1	0
Lt.-Col. J. Sterling	1	1	0
Capt. A. C. Clarke, R.N.	1	1	0
Capt. S. A. Johnson, R.N.	1	1	0
R.-Adm. W. H. Henderson	1	1	0
Lt.-Col. A. G. Holland	1	0	0
Capt. P. H. Wright, R.N.	1	0	0
Major F. T. Clark	1	0	0
Total	152	4	6



Royal United Service Institution

Whitehall, London, S.W.

On the occasion of a recent visit of the Prince of Wales to the Museum of the Royal United Service Institution, His Royal Highness evinced particular interest in the silver Statuette of Lord Nelson which the Council made an unsuccessful effort to acquire for the Institution by subscription last year.

The Statuette is of standard silver, weighs 893 ounces, and stands 2 feet 9 inches in height. The workmanship has been pronounced by experts to be early nineteenth century, and the modelling to be exceptionally fine. The Statuette was presented by His Majesty King George III. to the great Admiral on the anniversary of his victory of the Nile, and is, therefore, of historic-national interest, as well as an object of artistic merit and intrinsic value.

His Royal Highness the Prince of Wales has expressed the hope that the Statuette may yet be acquired by the members of the Institution, and has given practical expression to this wish by graciously accompanying it with a donation of £10 to the fund if it should be re-opened. In these circumstances the Council feel that it would be the wish of the members if another effort were made to obtain the funds to purchase the Statuette. And it has occurred to them that, after the interest which His Majesty the King has always shown in the Museum of the Institution, and in view of his having lately deposited in the Museum the relics of H.M.S. "Victory" from Windsor Castle, the present would be a fitting opportunity for another appeal to the members to contribute the £500 required to purchase the Statuette, and place it in the Museum in commemoration of His Majesty's Coronation and happy restoration to health.

[P.T.O.]

But of these, 9 Battalions Infantry are apportioned as Garrison troops. To these are added 4 Regiments = 40 companies of Fortress Artillery and 4 companies specially-trained armoured Forts Artillery, with 4 companies of Fortress Engineers.

Cavalry can be brigaded with the Horse Artillery when required.

The war strengths of the units are given as follows:—

Infantry.					Cavalry.				Artillery.				
—	Offrs.	Men.	Hrs.	Wgns	—	Offrs.	Mn.	Hrs.	—	Offrs.	Men.	Hrs.	Wgns
Field Bn. ...	17	894	18	6	Sqdrn...	5	131	133	Fd.Bty.				
FortressBn.	15	851	3	—					6 guns	4	126	123	8
									H. Art.	4	162	181	8
									Frt.Art.	4	169	—	—

The Militia has been re-organised. The period of service in this is raised to 8½ years for the land forces and 5½ for the Navy, 11,000 of the former and 600 of the latter being enrolled in 1901. When they are completing their eighth year the Militiamen are transferred to the Landwehr, the country being divided up into Landwehr districts under a commandant, and in this they continue to serve for 7 years, being formed into companies and battalions. Landwehr depôts for mobilisation are formed. Men are then called out for exercise twice in their 7 years.

ITALY.

Very few changes were made in the Italian Army in 1901. The chief attention under the vigorous administration of the young King has been paid to perfecting the existing organisation and troops.

The artillery is being gradually remodelled.*

Each of the 12 Infantry Divisions is organised for war as under:—

Infantry.				Cavalry.		Field Artillery.			Engrs.	Supply Company	Bearer Company
Brig.	Rgts.	Bns.	Cos.	Rgt.	Sqdns	Rgts.	BrDiv	Batt.	F Cos.		
4	9 includ- ing 1 Brsag. herl.	27	108	1	6	2	4	16 6 guns.	2	1	1

The Army comprises:—1. The Standing Army. 2. The Mobile Militia. 3. Sardinian Militia. 4. The Territorial Militia; the approximate strengths being as under:—1. 512,000 men. 2. 208,000. 3. 12,000. 4. 390,000. The total *rationed* strength being about 3,351,000 men, being nearly 183,000 in excess of the numbers last year.**

* A few notes regarding the artillery re-organisation will be found in the JOURNAL for April, 1902, p. 550.—E. G.

** See JOURNAL for October, 1901, p. 1189, and for July, 1902, p. 954-5, for details.—E. G.

Every able-bodied Italian man is liable to service from his 20th year with the Colours. After 3 or 4 years, or on reaching his 29th year, he is transferred to the Mobile Militia (Landwehr), and at 33 to the Territorial Militia till his 40th year, when all service liability ceases. About one half of the youths attaining the required age fail to enter the Service on account of disability, desertion, etc. Youths are not allowed to leave the country after their 18th year till their 28th, without special permission of the military authorities.

No manœuvres on a large scale were held in 1901, but Tactical Field Manœuvres were carried out in different Corps as usual, and the King attended those of the 1st and 2nd Corps, but not in state. It was more like a surprise visit in his motor car. Winter exercises of Infantry and Artillery also took place in the Mountain Districts, and snow shoes were made use of. Siege operations were carried on against Fort Bard.

RUSSIA.*

The peace strength of the Russian Army at the end of 1901 was recently given in detail in the JOURNAL for June, p. 807, and a summary was given in last year's Report, October, 1901, p. 1191. The details given in von Löbell's Report this year are voluminous, and cannot be epitomised here. The total *war* strength is estimated approximately as:—

—	Officers.	Men.	Horses.
In Europe ...	45,580	2,311,160	582,200
In the Caucasus ...	6,350	320,800	95,400
In Asia ...	4,570	222,000	52,700
	<u>56,500</u>	<u>2,854,260</u>	<u>730,300</u>

2 new Brigades of Finland Rifles, each of 4 Regiments, each of 2 Battalions, were formed in lieu of the 3 existing Battalions (one in each district). The period of service of the Finnish troops is:—

3 years with Colours.

15 years in the Army Reserve.

4 years in the Opoltschenie (National Reserve).

22

In many cases, after 2 years' service, the men are sent on furlough. In the Army Reserve they attend two trainings, lasting 6 weeks each. In the National Reserve the men who have joined during the last 4 years

* A good account of the organisation, etc., of the Russian Army is to be found in an annual by Major C. M. (Zuckschwerdt, Leipzig, 1901.)

are trained in a like manner. In future about one-third of the men becoming liable to service will be called up annually.*

An Imperial commission has been sitting to report on the Cossack Service. The term of active service is to be reduced from 4 to 3 years, the preliminary training is to be completed earlier than heretofore, only 6 months being allowed before they are incorporated in their regiments for field training or war. They are to be given horses, equipment, etc., as well as arms.

The reforms in the Staff College, the Junker Schools, and other educational establishments, are detailed at length in the Report, which shows that good educational progress is being made. The Imperial Manœuvres in the Petersburg and Finland districts are briefly described, and the Mobilisation practices show what exertions Russia is making to keep her vast Army in readiness for any emergency, and at the same time pains are being taken to raise the tone and religious feeling of the men, which the Tsar is very anxious to further.

THE UNITED STATES OF NORTH AMERICA.

The new law of the 2nd February, 1901, replaced that of 1899, and laid the foundation on which the work of military reform will be reconstructed. President T. Roosevelt who succeeded the murdered President McKinley on the 14th September, 1901, and who has strong military proclivities and had some military experience in the late war with Spain in Cuba, and the Minister for War, Senator Elihu Root, who was appointed to that office after the war, seem to be personalities well fitted to carry out the necessary re-organisation. The War Minister has rapidly mastered the essentials of war administration. The President in his first message to Congress in December, 1901, insisted on the immediate necessity for improvements in the Militia and Volunteers, the National Guard system being antiquated and useless, and on the Militia being armed with the same weapon as the Standing Army, etc.

The Report gives the details of the United States permanent forces as well as of the troops raised and despatched to the Philippines, which we regret space considerations will not admit of reproduction, and a short account of the various military schools and institutions.

PART II.

Reports on the different Branches of the Service.

THE TACTICS OF INFANTRY AND OF THE COMBINED ARMS, 1901.

General.—The campaign of the British forces in South Africa having, after the occupation of Pretoria, lapsed into Guerilla warfare, it is

* Some notes on the re-organisation of the Finland troops will be found in the JOURNAL for August, 1901, p. 1023.—E. G.

of but little interest to us Germans. The attempt to conquer the Boers by means of flying columns failed, because they always dispersed when they were overtaken and then assembled again only to repeat the process, and because the country was too vast to enable so active and mobile a foe to be coped with by ordinary methods. To secure his long lines of communication therefore, and to restrict the mobility of the Boers, Lord Kitchener had recourse to a blockhouse system. These defences, at first 2,700 metres and afterwards only 900 metres apart, were constructed along the lines of railway. They absorbed 135,000 men and 80,000 horses. They held from 10 to 15 men apiece, and in this exposure of small numbers to annihilation lay the danger. Moreover, the discipline of the force necessarily suffered. Major Callwell, in his brochure on "The Tactics of To-day" generalises too much and is inclined to extremes. He rightly urges the necessity for simultaneous action of Infantry and Artillery, denies the practicability of a previous preparatory bombardment by Artillery, and affirms the necessity of firing over the heads of the attacking Infantry until the moment of assault; for if this fire ceases, the assaulting troops are mown down by the fire of the Infantry of the defence, and suffer far greater loss than by chance ill-directed or timed shots from their own guns. He advocates complete extension of the attacking Infantry, even to the rear-most échelons, for all movements in close order are impossible within 2,000 yards of the position. He recommends a Battalion being formed for attack with 5 extended companies in front line finding their own supports in section columns with 150 yards distance between each. Two companies to follow in extended order at 300 yards distance, and one company, also extended, to follow these at 300 yards, so that a Battalion might fight on a front of 800 and a depth of 1,200 yards. The Report criticises this as impossible to keep up during the fight, for, where severe losses are felt, the extended lines would close on one another and towards the centre, thick close formations would result, and wide intervals would ensue between the different bodies, which is dangerous. Reinforcements must come up on the flanks, so that these wide intervals may be avoided, and this must be practised and the men instructed accordingly. It is impossible to keep single even widely extended lines directly behind one another when exposed to the enemy's close fire, unless all lie down.

The experiences of the South African war do not necessitate such wide extension. It was the want of adequate preparatory fire that was most felt. The extension of troops following in second line is, however, certainly unavoidable. The habit of firing only volleys was prejudicial to success, as was the advance by forward rushes before the preparatory fire had done its work. The short rushes had a bad moral effect on the men, who were with difficulty carried forward after many of these. Too much

importance was attached to Mounted Infantry. Suitable though these are for close reconnaissance, they can never replace cavalry for strategic reconnaissances or as an arm in battle. Modern Cavalry well supplied with machine guns and with horse artillery must be well trained to fight, and even when necessary to attack on foot. This the English Cavalry could not do, so a hybrid arm composed of Infantry and Cavalry men was constituted.

Sir Charles Warren, in the *National Review*, equally favours wide extension. He thinks a Brigade should fight on a front of about $1\frac{1}{4}$ to $1\frac{1}{2}$ men to the yard. This may have been possible with the Boers, who carried out very little *active* defence. The excessive extension he advocates could not be carried out against more active foes, but with the present weapons greater intervals than formerly were customary are feasible, and the new Regulations issued in 1901 in different Armies take this into account.*

INFANTRY TACTICS OF INDIVIDUAL ARMIES.

Austria-Hungary.—The Austro-Hungarian Infantry received their new Infantry Drill Book shortly before the Manœuvres of 1901. The chief alterations are in the methods of fire. Volley firing has given way to individual fire. The command "Rapid Fire" has disappeared, for it is seen that the soldier is only too much inclined to this in action. Concentration of many rifles upon special points of the enemy's position is inculcated, but other portions must not be neglected. To this end a suitable distribution of the fire must be entrusted to neighbouring bodies, and opportunities to be utilised annoying the enemy by the fire of even small bodies, when it can be delivered against his flanks and rear.

The companies are divided into skirmishing lines and company reserves, each company occupying a front of about 115 yards, each man occupying about 2 paces of front. The reserve follows *in close order* at a distance from which they can easily reinforce when required. The necessity of uninterrupted advance till within their own decisive range is constantly repeated in the Regulations, and the nearer this decisive position is to the enemy the better. The lie of the ground and the nature of the hostile fire will, however, chiefly determine this point. In the approach to this only such firing is to be carried on as is necessary to enable the attacking line to continue its advance, or to inflict decisive loss on portions of the enemy exposing themselves to fire. Long halts under fire are to be strictly avoided, and advance by rushes may have to be commenced from

* The Report quotes at length from the *Militär-Wochenblatt* and the *Jahrbücher* descriptions of the British methods of attack. These have already been summarised in the JOURNAL from February to June, 1902, so are not repeated.—E. G.

a long distance. The Regulations recognise the difficulties attending the simultaneous advance of long lines, and order that this is not to be undertaken by larger units than companies, and that these forward rushes are to be as long as possible; but this is to be regulated by the nature of the ground, the condition of the men, etc. Details are given, showing how this and how reinforcements are to be carried out.*

When the assault takes place a certain portion of the force is to be kept back to fire on the point of assault, or upon any counter-attacking troops. There is great danger in this of the assault being made with too weak a force. At 100 yards from the position fire ceases, the leader calls out "Assault," and all rush forward without crowding together. If a counter-attack straight to the front is made from the position, the assaulting troops throw themselves down and drive it back by rapid fire. If from a flank, the reserves deal with it.

On the defensive, advanced positions may be held if the enemy can be better brought under fire from these, or to gain time and mislead the attackers as to the real position, but this must not be allowed to degenerate into such engagements in front of the main defensive position as would defeat the object for which this is taken up. Night attacks and fighting in close country are thoroughly dealt with.

France.—The manœuvres near Rheims of the 1st, 2nd, 4th, and 28th Army Corps under the direction of General Brugère in September have been often described. They partook much of the show character. They were however a proof of the training of the three arms to work together with well-combined effect. The reconnoitring of the Cavalry was defective, and in action it was not a success, though the Corps Cavalry Brigades were occasionally well thrown into the fight and disengaged troops in critical situations. The Artillery was employed in masses, 20 Batteries being brought into line on the 19th. Greater attention was paid to cover than to fire effect.

The 7th Corps practised defending long lines of railway, 62 miles of the Belfort-Paris line being watched by Territorial Troops.

The provisional new "Infantry Training" was issued to the 9th, 11th, 17th, and 18th Army Corps. Opinions as to its merits differ, and it is being tried in other Corps also. Among the chief changes are the abolition of volley-firing and of Infantry scouts, the restoration of the supports in attack, the substitution of fours for files in certain cases, and the formation of fours by a short wheel as in the Cavalry. Bayonets are not to be fixed on the approach of Cavalry, and closed formations are only exceptionally to be adopted when continually threatened by these.

* These Regulations do not get over the difficulty of the large target offered by the men all rising simultaneously to rush forward together, nor of the loss of fire entailed thereby.—E. G.

Troops formed for attack or defence are formed into three bodies: the firing line, the assaulting line, and the reserve. The firing line in attack forms its own supports; in defence these become local reserves. The assaulting line forms the actual storming party in attack, and in defence delivers counter-attacks. The reserves are both in attack and defence to be kept intact as long as possible, and only engaged to secure victory or avert defeat. They are at the disposition of the commander of the force, and thus ensure unity of action at the decisive moment.

A French Infantry Division is reckoned to have 12 Battalions. The above division of the fighting troops into three bodies does not tally with the present French organisation, which is based on coupling the units by pairs,* so a breaking-up of tactical units is inevitable. As each of the three bodies above-mentioned has moreover distinct functions assigned to it, which do not come into play until the body in front has fulfilled its part, a sort of *échelon* formation results with all its disadvantages. However correct theoretically the division of an attacking body into firing line and assaulting line may be, in practice it leads to difficulties.

The planned attack is the basis of the French regulations, which divide it into march, deployment, preparation, assault, pursuit, and reformation. From 1,200 to 600 metres the advance is to be with extended files. The firing line is not to fire till it is necessary to do so in order to advance. Troops making a demonstrative attack only are not to advance nearer to the position than 600 metres. The assaulting line advances, taking advantage of cover, till within 200 to 300 metres of the firing line, when it is about 150 metres from the enemy, and has turned every rifle upon the point of assault. When the Divisional Commander thinks the enemy sufficiently shaken, he gives the signal for the assaulting line to advance, which moves rapidly forward, without troubling about guarding their flanks. The firing line continues to fire as long as possible; then the whole mass, fixing bayonets as it advances, precipitates itself, with shouts, on the enemy.

On the defensive, advanced positions, concealing and covering the main position, are recommended. Fire is sometimes to be withheld, to deceive the assailant, as the moral effect of great, sudden, unexpected loss is unnerving. Counter-attacks are to be made to relieve any part of the position which is endangered, and under cover of these the great counter-stroke is prepared. Such partial counter-attacks may be made by any commander of a closed body of troops when he sees his opportunity; but a general counter-stroke by order of the commander of the force only. This general counter-attack should, as a rule, be made

* The writer means that there are generally 2 Infantry Divisions in a Corps 2 Brigades in a Division, 2 Regiments in a Brigade, etc.—E. G.

before the enemy captures the position ; but if this cannot be done, then immediately after the assault, when he is in confusion and has not yet established himself. Defensive fire may be opened when the enemy is about 1,200 metres from the position.

Germany.—On the 1st April, 1901, 5 machine-gun detachments, each of 4 guns (drawn by 4 horses), 3 officers, 9 N.C.O.'s, 58 privates, 2 ammunition wagons, 1 baggage wagon, and 34 horses, were added to the establishment.

Machine guns can be used when the distances are known for firing over the heads of our own Infantry.

Patrol commandoes have been established in some Army Corps, selected men (jägers, etc.), to creep forward as Infantry scouts and observe the enemy, warn the troops against premature advance and against impending counter-attack, etc., and occasionally of opportunities that offer for flank attacks, etc.

Provisional Regulations for the employment of captive balloons have been issued. (For other changes see JOURNAL for March, 1902, p. 408.)

Great Britain.—New instructions for Infantry Training are about to be issued.

Russia.—In 1901, a new edition of the "Regulations for Field Service and Battle Instructions," by General Dragomiroff, was issued to the troops. These are similar to those in the German "*Felddienst*." In marches not more than 2 to 2½ miles an hour are to be reckoned, and a short halt is to be made after every hour. More stress than formerly is now laid in attack on fire effect and in defence on counter-attack. A great point is made of the advantage of night attacks. Before an action the soldiers are to be carefully instructed as to the part they are to play.

An account of the Grand Manœuvres at Kursk is in the JOURNAL for July, 1902, p. 967.

CAVALRY TACTICS.

General.—The rich experience gained by the British Cavalry in the South African campaign is of great value for European war, though their circumstances were peculiar.

Notwithstanding their excellent training in riding, etc., and their fine horses, the expectations formed of them were not realised. But the Cavalry of many another European nation would in like manner have failed, for none are sufficiently trained in dismounted action to enable them to cope with the Boers, and the difficulties of reconnaissance, owing to the far-reaching modern rifles in use and to smokeless powder, are enormous. Owing to the increased effect of shrapnel, columns moving

within its range suffer great loss. The English now move from cover to cover in single line.

Mounted Infantry was added to help the Cavalry in its manifold duties, and experiments are being made with Cyclist companies. Every British Cavalry Brigade possesses a Maxim gun detachment,* and lately each Yeomanry Regiment one Maxim gun. The distribution of machine guns to Cavalry is much discussed in all important Armies, and their advantages are generally recognised.

As regards the use of cyclists with Cavalry, no country, excepting Great Britain, has any organised bodies of cyclists, and the proper method of their employment is still under discussion on the Continent, though cyclist detachments have been tried experimentally as fighting bodies at all the gréat manœuvres.

The question of the lance as a Cavalry arm is still being argued. In Austria Major-General von Czerlien disputes the superiority of the lance, and the wisdom of its adoption by Germany. He does not, however, appear acquainted with the reasons for this or with the question at issue. The Belgian Colonel van Clorten wishes the whole Belgian Cavalry to be armed with the lance. In France all the front ranks of the Dragoon Régiments are now to carry lances.

In England all the Lancer Regiments and the front ranks of Dragoon Regiments are so armed. But it is held there that a good rifle is of more importance than either lance or sword, and the two Cavalry Regiments which left in December, 1901, for South Africa were armed with the Lee-Enfield long rifle. The Yeomanry are now armed and trained as Mounted Infantry.

CAVALRY IN INDIVIDUAL STATES.

Austria-Hungary. — The Report mentions the great Cavalry Manœuvres in the Marchfeld, near Wagram, at the end of August, 1901, under the Archduke Otto, commanding a Cavalry Division. But the few details given are of no special interest. It brings to notice an extraordinary long-distance ride carried out by Lieutenants Count Beroldingen and Streintez, of the Emperor's Own Regiment No. 1, between Stanislau and Czernowitz, a distance of nearly 85 miles, of which 16 had to be done on foot, leading the horses. The road was an unknown one, and the weather frosty. This was accomplished in 17 hours, or about 5 miles an hour, without halting to feed, etc.

* Each regiment had one Maxim gun, and each company of Mounted Infantry one, making five Maxim guns in a Cavalry Brigade. Machine-Gun Detachments will now probably have 2 M. Guns each.—E. G.

The quality of the Austrian Landwehr Lancers is much praised, as, though only 30 per cent. are practised yearly in manœuvres, they are in no wise inferior to the Regular Regiments.

France.—The great Cavalry Manœuvres of 1901 in France (near Troyes-sur-Seine) are of especial interest. The Regiments of the Cavalry Divisions were formed with 5 instead of 4 squadrons. The proposal to arm all Dragoon Regiments with lances was to be tested. Each Cavalry Division was to comprise, besides its Cavalry Regiments, the following :—

An Infantry detached company of 165 men on bicycles.

A Machine-gun detachment.

An Engineer detachment of 30 men on bicycles.

The Bicycle Infantry were to be employed as messengers, reconnoiters, and, in case of necessity, in support of the Cavalry in battle.

The Cavalry organisation was itself provisionally altered.

Hitherto the 7 Cavalry Divisions each consisted of 2 Cavalry Brigades, 6 Regiments, and 2 Batteries Horse Artillery; and in each Army Corps there was a *Corps-Cavalry* Brigade, which detached one squadron to each of the two Infantry Divisions in the Corps as Divisional Cavalry.

At the Troyes manœuvres two Cavalry Divisions of 4½ Regiments each opposed one another, one in the west one Division of 5 Regiments manœuvred against a Brigade.

The proposed new organisation would give 11 Heavy Cavalry Divisions each of 5 Regiments of 5 squadrons and 4 Light Reconnaissance Cavalry Divisions of 6 Regiments (5 squadrons), and further a Light Cavalry Division from the Algerian Corps to be formed if required.

These proposals do away with Corps and Divisional Cavalry. These can be replaced by some Reserve Squadrons and Cyclists.

It is doubtful, however, if this re-organisation will take place. The exercises with Cavalry Divisions of 5 Regiments each were only a test.

At the Great Manœuvres near Rheims, 2 Cavalry Divisions each of 6 Regiments were allotted to each opposing force. We have not space to follow the Report in its detailed summary of the above-mentioned manœuvres, but Lieut.-General von Pelet-Narbonne gives his opinion in No. 105 of the *Militär-Wochenblatt* of 1901 that the lessons drawn from them by French Cavalry officers is that the Echelon Formation and Movements had become a perfect mania. The Regulations prescribe échelon with one advanced flank with advanced centre, and with both flanks advanced. The formation intervals and distances are left to the Commanders of Échelons (lines). In attacking Infantry at Arcis-sur-Aube the Cavalry Corps attacked two Brigades in single rank, chequer-wise, in 4 lines, each 150 metres behind the other, and the squadrons

écheloned at intervals of 150 metres. The whole front of the attack was 2,400 metres by about 450 metres deep. On the left flank a brigade was écheloned as a protection against hostile flank attack, and a Regiment followed in reserve. The attack adequately prepared by the Artillery was considered quite successful.

The experience gained with the new Field Guns at the Troyes Cavalry Manœuvres is interesting. The two Cavalry Divisions were each given 2 batteries of 4 guns each of the new pattern 75-mm. (2·95-inch) calibre, instead of the present service 80-mm. (3·15-inch) gun. The new gun did not answer for Cavalry owing to its weight, the time taken in limbering up, and to the difficulties in trailing the gun laterally. The weight decreases mobility. Owing to the spade, which on discharge digs deep into the ground, both the quick limbering up and the rapid change of direction of fire—as objectives quickly present themselves in a Cavalry action—are hindered, and it is considered that a gun without any spade to check the recoil is necessary for Cavalry.

The manœuvres in August of the 1st and 2nd Army Corps and 4th and 5th Cavalry Divisions under General Duchesne, and the 6th and 20th Army Corps and 2nd and 3rd Cavalry Divisions under General Kessler, between Vouziers and Reithel, are briefly described in the Report. The weather was very bad. These manœuvres closed with a grand spectacular Tactical Field Day before the Tsar, when the arrangements were very good and the troops skilfully handled. General Brugère commanded 4 Army Corps and a Cavalry Corps of 3 Cavalry Divisions against a smaller force representing the enemy.

Germany.—On the 11th May, 1901, the German Cavalry received their new musketry regulations, assimilating the targets, etc., to those of the Infantry, and more attention is being paid to their training in shooting. New regulations for the Cavalry Telegraph School have also been issued. Experiments in methods of crossing rivers by means of rafts, floating bags, lance-boats, etc., are being actively carried on. In the German Army trials with the “Radeau-Sac” and the Reysch lance-boats were made by the Hussars of the Guard Corps on the Havel. It is found that the collapsible boats are insufficient, and that a light portable equipment is needed on which the Patrols can quickly cross a stream. The canvas folding-boats in use being much liable to damage in transport, experiments were made last year with light steel boats.

In the German Army Manœuvres in West Prussia the Red Cavalry, Division A, gained the victory over Blue's Cavalry by early deployment into suitable attack formation, opportune unity of attack and skilful use of its H. A. batteries and machine-gun detachments, whereas the Blue Cavalry brought its artillery too late into action, deployed too close to the enemy into squadron columns, whereby the Brigades in the rear were

brought into action too late to be of effective use. One of its Regiments, advancing without due caution, was moreover surprised by the 1st Red Cavalry Brigade and put out of action.*

No increase of the German Cavalry is yet contemplated. After the increase of Artillery is effected, third Battalions will be raised for those Regiments which now only have two. The wish often expressed in these Reports for the permanent organisation of Cavalry Divisions in peace is still far from realisation. After the recent changes, placing the Field Artillery Brigades under the Infantry Divisional Commanders, the Cavalry Brigades are not likely, as a matter of principle, to be withdrawn from them. It is feared to make too much a special arm of the Cavalry, as was the case with the Artillery.

It therefore is all the more important that year by year a larger number of Cavalry Regiments should be gathered into Cavalry Divisions for manœuvres as such. As now the opinion is gaining ground in Germany, that a whole Cavalry Regiment** is not required as Divisional Cavalry, but that half a Regiment will now suffice for this, there will be more squadrons available for manœuvre in Division; and as no Cavalry Divisions are permanently formed in peace-time, it is more necessary than ever that Cavalry Brigade and Regiment Commanders should then have opportunities for yearly practice of Cavalry Reconnaissance on a large scale and in the quick and skilful manœuvring of large bodies of mounted men; and the more this is done the easier will be the task of the leaders on a sudden outbreak of war.

The recent (1901) manœuvres in West Prussia show how skilful leading of Cavalry may result in victory, even over forces much superior in numbers. Well-judged utilisation of the fire-effect of his own Artillery to press home opportunely well-combined attacks of the Cavalry Brigades, were prime factors which brought about victory.

The Expedition to China.—The experience of the transport of horses from America to China shows the importance of fresh air and water, and of good and sufficient feeding. As a width of only 2½ feet could be allowed for each horse they could not lie down, so those horses which showed excessive fatigue were supported by a broad band of canvas under the belly. This band was fastened up at the four corners to take the strain off the legs.***

* The general run of these Manœuvres was briefly described in the JOURNAL for January, 1902, though details were not gone into. See also JOURNAL for December, 1901, p. 1514.—E. G.

** A German Cavalry Regiment has 4 fighting squadrons.—E. G.

*** British officers are of course familiar with similar arrangements on well-filled Horse Transports.—E. G.

The American horse is of plebeian origin compared to the North Australian, and is of much less value as a riding horse, though of great use for draught. Only 30 horses altogether were sent out from Germany with the expedition troops. However, in the autumn of 1901, 400 horses and 100 mules were shipped from China to Germany to see what losses might be expected on the passage through the Red Sea. Owing to great care and to their being daily exercised on deck, they all arrived safely.

Great Britain.—In South Africa the British Cavalry did not fulfil the expectations formed of it, though it had good riders and well-trained horses in its ranks. Excellent as its horses were, they were spoilt by too careful grooming, over-feeding, and by being practised only over favourable ground. When the test of war came with unfavourable climatic conditions, unavoidable night exposure and, abnormally heavy work over heavy ground, they broke down. The riders were insufficiently trained in reconnaissance, dismounted action, and shooting. The horses rapidly collected from Hungary, Australia, North America, Argentina, and India, and shipped to S. Africa, were sent up to the front without any preparation immediately after disembarkation, and naturally succumbed. The heavy riders, with their heavy equipment, quickly broke down these weakened animals, from which extraordinary efforts were perforce required, and so their performances in no wise equalled those of the Boers. In attack, for which opportunities seldom occurred, they were either overpowered by the steady well-aimed fire of the Boers, or the latter, leaping on their well-trained ponies, rapidly rode away to take up fresh defensive positions, the British Cavalry having no chance whatever of catching them.

Owing to insufficient reconnaissance the British Generals were often badly informed of the enemy's movements, and, owing to indifferent measures of security, surprises throughout the whole war were the order of the day. Their bad training in shooting led to their defeat in action.

As the Cavalry utterly failed, Mounted Infantry were organised.* These were able, when superior in numbers to them, with the help of Artillery and machine guns, to take up the fight with the Boers. But they could not carry out the required reconnaissance, for they could not ride. Their want of knowledge of horsemanship and of the proper care of horses led also to greater waste of horseflesh than with the Cavalry themselves.

At the same time, Lord Roberts owed his comparatively quick and victorious advance to Pretoria to his systematic use of strong mixed detachments of Cavalry, Horse Artillery, and Mounted Infantry to envelop the flanks of the Boers in position. It was owing to this dis-

* The writer apparently thinks that no Mounted Infantry were sent out before this.—E. G.

couraging action, forcing their constant retreat, that the organised resistance of the Boer Republics was broken.

In the guerilla warfare which followed, the Boers could take full advantage of their warlike qualities as trained indefatigable riders, and as active, skilfully shooting Infantry skirmishers. They owed their knowledge of their opponents' movements to the inhabitants, not only of their own country, but of the Cape Colony, being favourable to their cause.

The conduct of the war by the British was therefore impotent, notwithstanding their superiority in numbers. Masses of Infantry are scattered over long lines of communications in guarding railway junctions, blockhouse lines, and in garrisoning important places.

The Cavalry, Mounted Infantry, Yeomanry, Mounted Colonial Corps are all hurried off to hunt down the Boers, who avoid the unequal combat, but take every opportunity of laying an ambush, effecting a surprise, or destroying railways, etc., and, though occasionally they have met with heavy losses, it looks as if they would be able to continue the war for a long time yet.

England is however at the end of its military resources. It becomes daily more difficult to comply with Lord Kitchener's urgent demands for trained mounted men and horses. There is scarcely any Regular Cavalry left in the United Kingdom, and, in spite of the high rate of pay offered, few volunteers are forthcoming.*

A first experiment** was made on the 24th August, 1901, with folding-boats of the James pattern, four of which were fastened together forming a raft to carry the guns of a Field Battery across the Medway, here 150 metres wide. The horses swam across and the men crossed in James boats.

Russia.—Cavalry manœuvres of large bodies were held in the St. Petersburg military district, in the Wilna at Grodno, and on the lower Dwina; in the Warsaw district between Warsaw and Siedlee in the Kief district; in the Moscow district between Smolensk and Oral; in the Odessa district near Bender, and in the Caucasus near Tiflis. The Russian Cavalry training, which is facilitated by its permanent organisation, and by the yearly increasing number of Cavalry Divisions, exercised in great Cavalry manœuvres, is certainly very good. No other European Cavalry is given such opportunities for improvement.

In the Cavalry swimming exercises at Maera, near Korno, on the 30th July, a whole Cavalry Division crossed the Niemen, here 280 metres wide. The arms, accoutrements, and clothing of the men and the horse equipment were carried across on small rafts made out of fascines of

* This Report was published in Germany, in February, 1902.—E. G.

** Experiments with folding-boats were made in England many years ago. See the JOURNAL for April, 1895, etc.—E. G.

straw and light boards, which were attached to the horses' tails. Some guns were drawn through the stream by long towing-ropes. The horses were sent across three abreast, about 10 paces distance apart, and each squadron took about 7 minutes swimming across. The lieut.-general commanding the Division also swam over.

In the Wilna district the officers of the Cavalry School were practised in the paper chase and in hunting, after the English fashion, the chase being every other day after some wild animal with a pack of English foxhounds. Officers awaiting promotion as regimental commanders have to lead.*

FIELD ARTILLERY TACTICS.

General Report.—The considerations regarding the armament and re-organisation of Field Artillery, which were weighed and discussed in 1901, have not led to any decisive action in the Armies of some of the Great Powers. On the whole there is a tendency, which we think correct, to allow time for technical development to devise a gun which shall satisfy the highest ideal. Even if this one idea of a barrel-recoiling gun has a great future before it, we must remember that practically this system is as yet only in its infancy, so that over one haste would be a great mistake and might lead to serious and irremediable consequences.

The "*Battle of the Modern Field Gun*" is being fought in Germany also, though the field gun which has been introduced here has in every way answered expectation. No doubt we shall in course of time still further improve our armament, in accordance with technical progress and with the advance of other nations, but it would be premature to indicate now the "when" and "how." We must, in determining the question whether we are bound to haste in this matter, consider not only the possibly exaggerated advantages of foreign material, as set forth in foreign literature, but also the defects which have shown themselves, and must not rely on performances regarding which only untrustworthy reports are yet to hand.**

A field gun that like the French is so heavy when unlimbered cannot nowadays be considered *tactically* efficient.

A gun which recoils on its carriage facilitates the use of protective shields more than one of which the carriage itself recoils. The question of these shields has been discussed from different points of view ever since the publication of the Langlois work (see *Militär-Wochenblatt*,

* If some of our mounted officers were trained on this excellent plan we should hear fewer complaints about their riding.—E. G.

** They are spending so much on their Navy in Germany, that the military experts may perhaps be disposed to minimise the necessity for further expenditure on new guns.—E. G.

Nos. 37, 49, 50, of 1892), and in France still many hold the protection afforded by them insufficient. Neither Russia nor Italy has adopted them. Belgium and the United States have.

The French lay great stress on rapid fire, and consider that, even after the reduction of their Batteries to four guns, one of their Batteries is superior to two or three German ones. This is a delusion. Peace experience shows that when rapidity increases beyond a certain rate of fire, efficiency decreases. This limit of *effective* rapidity of fire is more a matter of the *quality* and training of the gunners than of the nature of the gun.

The question of the reduction of the number of guns per Battery is bound up with the necessity or otherwise of increasing the total number in an Army Corps. It was at first thought in France that they must have 120 per Army Corps to match against the German 144.* The French have now only 96 guns per Army Corps. The French Batteries are now supplied with 144 common shell.

In a few Armies the Corps Artillery has been given up, and the batteries distributed among the Infantry Divisions, so as to give the commanders of these in peace-time a knowledge of this arm which they would have to wield in war, and in order to better understanding of the working of Artillery by the other arms of the Service, it is now customary for field officers of all arms to attend the Artillery instruction courses and practices.

The French complained that only Mountain Batteries were sent to China, so some 75-mm. Field Batteries were sent out later, but they did not arrive in time for the Relief of Pekin. Mountain Batteries were on the whole more suitable to the bad roads of China. But the German Field Batteries and the light Field Howitzer Batteries were able to follow the troops wherever they went, even in the hilly country.

ARTILLERY TACTICS IN DIFFERENT ARMIES.

Austria-Hungary.—In September, 1901, the following troops were exercised in the attack of an intrenched position near Veszprim, north of the Plattensee, with live shell:—2 Regiments Infantry, 2 Squadrons Hussars, 4 Batteries Divisional Artillery, 1 Provisional Battery, and 1 Battery of Position Artillery with Engineers and a Captive Balloon. These troops made a two days' march to the battle-field, and at once made dispositions for the attack, which were carried out as in

* The number of Batteries attached to each Infantry Division in the German Army now varies slightly. On the average it may be taken that there are with each Division 2 Field Artillery Regiments of 2 Abtheilungen (Brigade Divisions), which comprise 3 Field Batteries each, and 1 or 2 Horse Artillery Batteries in peace-time. There is no Corps Artillery.—E. G.

war. After the bombardment the rest of the fighting was carried out with blank ammunition and a counter-attack warded off.

The Artillery well prepared and supported the Infantry attack, and the aim and timing of the bursts of the common shell and shrapnel were good, but the effect on the defender's well-covered Infantry and the guns in sunken emplacements was slight. This has led to the conclusion that light Field Howitzers for covered fire must be provided. It is intended to re-organise the Artillery service, each corps, and Divisional Artillery Regiments being into 2 Brigade Divisions each composed of 3 Batteries. The latter are to be reduced in size from 8 to 6 guns. Each Corps Artillery Regiment will probably be also armed with 2 or 3 light Field Howitzer Batteries.

France.—The new (Provisional) Artillery Training of the 16th November, 1901, shows what ideas prevail in the French War Office in regard to the principles which govern Artillery Tactics with the 75-mm. (2·95-inch) Q.F. Field Gun. But the new drill has not been fully tried by the troops. It is to be reported on the 15th October this year. Four gunners are required on ordinary ground to move the gun, and six men for the ammunition wagon.

The Report goes into details of quick firing, salvos, etc., which we have not space for.

The Field Battery is divided into sections, with wagons, as follows:—

—	Guns.	Ammunition.	Field Forge.	Artillery.	Forage and Provision.
1st Section .. .	2	2	—	—	—
2nd „	2	2	—	—	—
3rd „	—	5	—	—	—
4th „	—	3	1	1	3
Total ..	4	12	1	1	3

Its strength is 1 captain, 3 lieutenants, 170 men, and 167 horses, and carriages as above. One gun and wagon constitute a half-section.

The fighting portion consists of the guns and ammunition wagons.

The principles of action are to act if possible by surprise, to pour in a rapid and effective fire on well-chosen objectives, and, if possible, to do so from hidden spots, the most careful use being made of the ground, especially in opening distant fire.

The offensive spirit is thoroughly inculcated: no retirement without orders, and every effort to be made to obtain preponderance and rapidity of fire, the heavier guns being brought under the Artillery commander to ensure unity of action when required.

Corps Artillery *is not abolished in France*, but each Division has a half-regiment of Artillery attached to it for tactical purposes, and placed under the Divisional Commander in camp or garrison. An Artillery Regiment of 12 Batteries is divided into two portions, each of 6 Batteries. For this, one portion commanded by the colonel, and the other by the lieut.-colonel second in command.

The Reports concerning the new Artillery in the autumnal manœuvres are satisfactory. They worked well with Infantry, but here and there a want of understanding with the chief command was perhaps apparent.* Some Reports declare that in spite of its weight the new gun was mobile enough. On the other hand, it was observed that in heavy ground it was necessary to double the gun detachments to move the gun about, and even sometimes to call on the Infantry for assistance.

At the Cavalry Manœuvres the gun was tried with the Horse Artillery, for which it was scarcely mobile enough, and unlimbering for action took too long. The Artillery are to change stations frequently, so as not to shoot over the same ground always. A new Field Artillery School of Gunnery has been established at Poitiers.

Germany.—In the 1901 manœuvres the advantage of the abolition of the Corps Artillery and placing it under the command of the Divisional Generals was proved. As a rule the Artillery deployed by Brigade or Regimental Divisions, and want of space was not felt. The endeavour to work in unison with the Infantry and the successful support of other arms was conspicuous. The effectual concentration of fire, in situations where such action would just turn the scale, and a laudable desire to be well forward in supporting the Infantry attack, were equally notable. The ground was skilfully utilised for cover and the spade was frequently and suitably employed for entrenching.

In the course of the summer the practice of the attack on entrenched positions was carried out in 3 Army Corps with live shell and ball ammunition, and in these the Heavy Artillery took part. At one of these near Thorn it was shown that the curved fire of our Light Field Howitzers, well handled, was excellent, scarcely visible shelter trenches with overhead cover having been effectively shelled. The united action of the Infantry and Artillery showed good progress, and the Field and Position Artillery worked well together, being directed either by the senior Artillery commandant or by the commander of the whole force himself. The excellence of the shooting proved the excellence of our material, the detractions of foreign literature notwithstanding.

Great Britain.—The Report is here chiefly taken up with a résumé of Major Callwell's "*Tactics of To-day*," a brochure well known doubt-

* The Reports from S. Africa of Artillery officers show how imperfectly some of our own generals were acquainted with the capabilities of the various kinds of guns, etc.—E. G.

less to our readers, so its retranslation is unnecessary. It mentions the proper choice of ground and concealment of guns as one of the important lessons, and the difficulty of coming up and occupying a fire position simultaneously in the old method. Also of the Field Artillery Batteries following the Infantry in the close assault.

The writer also briefly quotes some papers in the "Proceedings of the Royal Artillery Institution," and wonders at the absence of good Field Glasses in our Batteries.* He quotes a writer who from his war experience urges the sending forward of only 3 ammunition wagons at a time in action, and thinks these should always be behind the intervals between the guns (not each covering its own gun).

SMALL ARMS, 1901.

General.—The opinion, founded on the experience of the South African War, that it is inadvisable to reduce the present calibre of rifles, gains ground. Dr. F. A. Suter, who served in the war with the Swiss Ambulance has reported in detail in his interesting book on the subject, published by Schmidt und Günther, of Leipzig, in 1901, on the wounds effected by rifles of small calibre. In the *Revue d'Artillerie*, August, 1901, Captain L. Fossart examines the question in the light of previous war experience, and comes to the following conclusions as regards the effect of modern weapons:—

1. The proportion of men killed and placed *hors de combat* relative to those struck remains as before.
2. When wounds are not mortal they heal quicker, and their consequences are less serious, so that for the number of men incapacitated during the whole campaign is less than before.
3. The effect as regards individual men placed *hors de combat* is less.

Captain Fossart thinks that there would be no advantage in making the calibre more than 8 mm. (.315 inch), but rather in its decrease, for although its wounding power is less, ballistic and ammunition considerations outweigh this. On the whole, there is no inclination in individual States to lessen the calibre, but to introduce so-called self-loaders of the existing calibre. France and England, who are about to adopt armaments, intend to introduce a rifle which will enable the firer to aim steadily.

*Every Battery commander should be provided with a *good* telescope, and every officer and sergeant with a powerful field glass. I believe the Government are now making arrangements for this. A thorough system of observation and signalling should be established and constantly practised.—E. G.

"Self-loading pistols are even more in demand, and the "Parabellum," of "The German Arms and Ammunition Factory" of Berlin, is an example of a hand weapon admirably adapted in all respects for war.

In the *Kriegstechnische Zeitschrift*, 1901 (Vol. 8), an Austrian officer proposes for drill purposes, manœuvres, etc., a sort of safety case which being inserted in the bore diminishes its calibre by 1 mm. and thus will only admit the blank cartridges which are to be made of slightly less calibre than the ball cartridges. This will obviate the serious accidents that often occur through the issue in error of ball cartridge at manœuvres.

PROGRESS IN THE ARMAMENT OF INDIVIDUAL STATES.

Austria-Hungary.—Experience with the Repeater Rifle pattern of '88-'90 and the Repeater Carbine led to the construction of new patterns in 1895. There was not sufficient difference however between these and those of the old pattern to necessitate a universal re-armament of the troops, so the conversion of the old '88 pattern was stopped for financial reasons, and it was decided to issue the new '95 pattern rifle to Infantry and Rifle Battalions as soon as the old ones were worn out, and the Field and Garrison Artillery and the Supply Corps which had to be given new rifles were armed with it. The Cavalry were re-armed with the '95 pattern carbine, their old carbines being handed over to the Train Troops. The trials with the new weapon proved it to be satisfactory.

Some details of a new pattern Repeater Rifle made in the Steyn Small Arms factory, and called the Mannlicher-Schönauer Rifle of 1900, are as follows:—Calibre 6.5 mm. (.256 inch); weight without bayonet, 8 lbs. 2 ozs.; length without bayonet, 4 feet 4 inches; with bayonet, 4 feet 10 inches; length of barrel, 2 feet 4 inches; weight of cartridge, 22.43 grammes (.79 oz.). The bolt action is somewhat like that of the Mauser, with a turning movement to open and close the breech, etc.

Another self-loading rifle of the same calibre on the Mannlicher system has been turned out by Seidel & Son, of Vienna. Other calibres are also made.

Belgium.—The Infantry, Cavalry, Technical Troops, and the Burgher Guard are armed with the 7.65 mm. (.301 inch) Mauser '89 pattern.

France.—The Infantry is still armed with the Lebel rifle, calibre 8 mm. (.315 inch), pattern '86; the Cavalry and Artillery with carbines of that pattern. The Train troops are said to have still retained the old Gras pattern '74, calibre 11 mm. (.433 inch), which is however scarcely credible.

The armament of the troops with the Daudeteau rifle seems to have fallen through, unless this has been carried out as secretly as the introduction of the new Q.F. field guns was. But according to press reports, "self-loading" instead of repeating rifles are to be adopted. One of

these, which has a magazine in the butt containing 16 rounds, is, it is said, being tried in the 9th Corps in Algeria. The cartridges fit over one another in the butt in four parallel rows. These can be drawn into the breech by pressing a spring without taking the rifle from the shoulder. It is called the Lamacchia rifle and is ballistically similar to the Lebel, but has a calibre of 8 mm. and weighs only 6·7 lbs. Meanwhile the muzzle velocity of the Lebel is increased to 2096 fs.

This new French powder is said to give the following comparative results :—

Lee-Metford Rifle...	{	Cordite	= 1834 fs.
		New French Powder	= 2379 „
Mannlicher ...	{	Russian Powder	= 1712 „
		German	= 1919 „
		New French Powder	= 2329 „

In France many voices cry out against any diminishing of the Lebel calibre ($\cdot 315$ inch) in any new rifle to be adopted.

Germany.—At the close of the year included in the Report the Guards, the Marine Infantry, and the Infantry of the East Asiatic Brigade were armed with the 1898 pattern. This was briefly described in the JOURNAL for October, 1901, p. 1215. It is about to be issued to one Prussian Corps. A new short rifle of the '98 pattern, a sort of carbine, is on trial. All the other corps still use the old '88 pattern rifle. According to the report of the Special Committee in Berlin, the '98 rifle is said to have evinced its superiority over those of all the other contingents. That of the English was the worst.

A self-loading pistol is prescribed in the dress and equipment regulations for officers and men of machine-gun detachments, signallers, etc. The actual pattern is not yet decided on. The Mauser pistol (described in the JOURNAL for November, 1900, p. 1323) and the "Parabellum" self-loader, 1900 pattern, are the principal rivals, and the latter will probably be successful in the trials in Germany as it has in other countries. The following are some of its chief details:—Calibre, 7·65 mm. ($\cdot 301$ inch); length of barrel, 4·8 inches; total axial length, 9·33 inches; depth, 5·3 inches; weight, 1 lb. 13½ ozs.; do. of cartridge (loaded), 16½ grs.; penetration at 50 metres—fir, 6·3 inches; beech, 3 inches; sheet iron, $\cdot 34$ inch. It is said that with expert shooting and clips ready to hand it can fire 100 shots per minute.

Its durability and non-liability to get out of order are remarkable. Official trials made when 3,000 shots were fired with powder charges 25 per cent. heavier than the ordinary ones, resulted in the weapon being in no way damaged, thereby demonstrating its absolute security, the breech-closing arrangement being very perfect. It has no hammer. In connection with the locking mechanism, the safety catch is so arranged that it works automatically, so that it cannot go off unless gripped in the

hand for firing in a particular way. This safety when hanging by its cord or in its holster, or even when it falls to the ground violently, is of priceless value to the person using it and his surroundings. At the same time, its repeating arrangement is such that immediately after the delivery of each shot the firer can discharge others in rapid succession. Further details of this excellent weapon are to be found in the Swiss *Militärische Blätter*, 1901, Vol. XII., and in the company's description, published by Eisenschmidt, Berlin.

Many experiments with small-bore rifles have taken place at Spandau, the result of which is that the present calibre, 7.9 mm. (.311 inch) will probably be adhered to, as we indicated in the Report for 1900. A certain Louis Schlegelmilch is said to have brought before the authorities a magazine rifle that will contain 10 rounds. He is an employé in the Royal Arms Factory at Spandau.

Great Britain.—The European and the greater part of the native troops in India carry the 7.7 mm. (.303 inch) Lee-Metford rifle of '91 or Lee-Enfield of '95. The native levies carry rifles of old construction and of different patterns, Martini-Henry, Snider, etc. The officers carry the Lee-Enfield or a revolver.

SMALL ARMS.

Great Britain.—The inferiority of the present Lee rifles compared to those of other Powers is now acknowledged even in the Army. Notwithstanding the declaration of the War Minister in 1901, the fiasco of the Lee rifles can no longer be concealed. According to reports, especially in *Arms and Explosives* of July, 1901, great stress is laid upon the necessity for any new system introduced being able to use the existing ammunition. The existing cartridge rim precludes the use of clips or chargers as used in foreign rifles. The Harris magazine is designed to meet this difficulty. A box fits into the stock below the receiver, not projecting below the woodwork, and containing 6 cartridges, which can be introduced singly or together, with great rapidity, from above on to a metal corrugated platform, which is at once sunk on pressing a thumb-lever with the left hand, holding the fore-end of the rifle. The cartridges then, on falling with the platform, automatically arrange themselves above one another in two rows in parallel zigzag order. The action is simple and does not interfere with the "cut-off," so that the rifle can be used as a single-loader while containing 6 rounds in the magazine, which can be unloaded by pressing the lever with the left thumb and turning the rifle over, when they will fall out into the right hand.

It seems probable that the Harris magazine may be adopted, for all the reports of it are most favourable. An improved Lee-Enfield rifle has

also been experimented with, which is 3 inches shorter than the regulation rifle and higher in proportion. It has the Harris magazine and the Ross straight-pull.*

The advantage of the straight pull is that there are only two motions required in loading, and that the upper arm and right elbow of the firer is less exposed when loading in the prone position.

The Australian "Hylard" Magazine Rifle and Bandolier have also been tried.

In England they are not satisfied with their cordite powder, the excessive heat generated by the nitro-glycerin eating away the bore and using up the barrel too quickly. In the experiments, the German Rottweil guncotton powder seems to have come off victorious, but many voices were raised against its introduction, so the question is still in abeyance.

A Mr. H. Gabbett-Fairfax has invented a new automatic Pistol called the "Mars," which, with its ammunition, is manufactured entirely in England. It is made in 3 calibres, a comparison of which with the Service Revolver Ammunition is as follows:—

Calibre.	Weight of Bullet.	Charge.	Muzzle Energy.	Length of Pistol.	Weight of Pistol.
Service Revolver ..	265 grs.	18 gr. (black)	287 ft.-lbs.	11·5-inch	—
11·3 mm. Mars Pistol = ·45in.	363 "	12 " (cordite)	760 "		
9 " " " = ·36in.	160 "	12 " "	960 "		
8·5 " " " = ·33in.	140 "	10 " "	950 "		
Mauser Pistol .. = ·30in	85 "	7·75 " "			

* The Ross rifle, designed by Sir Charles Ross, Bart., has been adopted by the Canadian Government for the armament of the Dominion troops, and is under consideration by the Commonwealth of Australia also.

Its length, without bayonet, is 4 feet, or with, 4 feet 8½ inches.

" weight " " " 7½ lbs. " 8½ lbs.

Like the Harris, its magazine is flush with the wood, without projection, and is of the same class, but contains only 5 rounds, which are received into it by lowering the metal platform in like manner. It claims to be simpler, as there are fewer parts. It has a "cut-off," worked by a slide on the right side of the breech-shoe. As in loading the magazine singly by hand quickly, some cartridges are apt to fall outside instead of into the breech, a carrier or loading case of cardboard or thin tin is supplied, containing 5 cartridges, which is covered with a thin tape lightly fastened on. This is stripped off at the moment of loading, and the cartridges tipped over into the top of the magazine, being lowered into it as above. The bolt is a front-lock straight-pull, one movement unlocking or locking, and cocking the firing pin, and it has a strong extractor. Its rate of fire is about 20 rounds per minute. It is a handy light rifle coming easily up to the shoulder. It has been well tested in every way; whether it is quite as strong as the Lee-Enfield is a moot point.—E. G.

The magazine of this pistol is contained in the stock in the form of a slide inserted from below. The special feature of this pistol is that the breech-block and barrel recoil together throughout the whole length of backward travel. It is said to be able to fire 180 rounds a minute.

A quantity of Mauser rifles and ammunition captured in the Boer War is to be sent to India wherewith to arm the Frontier Militia, Police, etc.

The establishment of a Small Arms Factory near Calcutta, which is to be in working order in two years, will much increase India's defensive strength.

Italy.—The Infantry and Mobile Militia are armed with the Mannlicher Carcano Rifle of 1891-2. 6.5 mm. (.256 inch), the Cavalry with Carbines of this pattern. Experiments have been made with two new rifles, the Cei Rifle of 1901 and the Freddi of 1900. The latter is said to be of very simple construction.

Japan.—The whole of the Infantry is now armed with the 6.5 mm. (.256-inch) Meidgi 30 Rifle designed by General Arisaka in 1897. The Japanese officers favour the Mauser system with clip loaders.

Portugal.—The Active Infantry and 1st Ban of the Reserve are armed with the .256-inch Mannlicher Rifle of 1900.

Roumania.—The Roumanian Forces are armed with the .256-inch Mannlicher of '93.

Russia.—The Active Army and 1st Reserve Troops are all armed with the three-lined rifle of '91, calibre 7.62 mm. (.299 inch). The Cavalry have the Cossack-carbine of '96. The Militia still retain the old Berdan of 11 mm. (.433 inch). According to the *Siecle*, a new rifle is being tried in Russia, which possesses all the virtues of the Mannlicher and is far superior to the Mauser.

Switzerland.—The Swiss Army has the 7.5 mm. (.295 inch) (Schmidt-Rubin) of '89-'96, and the Position Artillery Fortress Troops, telegraph and balloon companies, cyclists, etc., have been supplied with the 7.5-mm. short rifle, '89-1900. The officers carry a pistol, calibre 7.65 mm. (.301 inch), of the Borchardt-Laeger construction.

Some details of the above short rifle are as follows:—Calibre, 7.5 mm.; number of rounds in magazine, 6; weight of a round, 27.5 g. (423 grs.); charge, 1.9 g. (29½ grs.), smokeless powder; initial velocity, 1902 f.s.

The Swiss authorities are now experimenting with a new Repeating Rifle, invented by a M. Fleury, of Aesch (near Basel), which, it is said, indicates by its construction a complete revolution in the mechanism of Repeating rifles.

Turkey.—The cadres of the European Army Corps (1st, 2nd, and 3rd) are supplied with 7.65 mm. (.301-inch) Mauser of '90; the 4th Corps in Asia Minor has the 9.5 mm. (.374-inch) Mauser Magazine rifle; the other four Corps in Bagdad, Tripolis, Yemen, etc., still have the Martini-Henry and Peabody rifles.

The manufacture of the 7.65 mm. Mauser and of its ammunition is now actually proceeding in Turkey, and the Imperial Factory near Constantinople can now, it is said, turn out 100,000 cartridges daily.

The United States of N. America.—The land forces are armed with the 7.62 mm. (.299 inch) Krag-Jørgensen of '92, the Navy with the Lee straight-pull of '93, calibre 6 mm. (.236 inch). Experiments are being made with a rifle which is a sort of combination of the Mauser and Krag-Jørgensen systems. This is said to give to its bullet a muzzle velocity of 2300 f.s. Trials are also being made with telescopic sights for rifles. Trials are being carried on with the Parabellum self-loading pistols which can fire over 100 shots a minute with great accuracy. Of course the American manufacturers are much against its introduction, but it will probably soon be made in America on a royalty.

The Boers in the Transvaal and Orange State were chiefly armed with the 7 mm. Mauser of '93 (.276 inch), and also with the captured Lee-Metford, etc., rifles. They had several Mauser pistols. Very few used telescopic sights as reported, only their natural and highly trained powers of vision are so great that they can distinguish men from animals at immense distances, and the least dust movement on the horizon is a sufficient indication to them.

The tactical effect of the magazine rifle of small calibre is thus summed up by Captain Fossart in the *Revue d'Artillerie* for October, 1901:—

1. The number of men killed and placed *hors de combat* is about the same as before.
2. The wounds inflicted being slighter and more quickly recovered from, the number of men disabled throughout the whole campaign is rather less.
3. The moral effect of the wounds on the men is less.
4. It is necessary for Infantry to commence firing at approaching Cavalry at a greater distance than formerly, otherwise wounded horses will still gallop forward and break through their ranks, though they may after that succumb.

Owing to the far-reaching effect of the light flat trajectory bullets, it is difficult to give the wounded much assistance from the Bearer Companies while under fire.

ARTILLERY MATÉRIEL IN 1901.

General.—The Q.F. field gun is still the burning question of the day, "The Battle of the Modern Field Gun," as it is aptly termed in an able anonymous pamphlet bearing that title. Last year we indicated that the main question to be debated was: should the whole gun-carriage recoil, or should only the gun-barrel itself recoil axially in the cradle on its carriage? We might almost affirm that this question is now decided in favour of the latter principle. The main point lies in the easier adaptation of steel shells to the gun that recoils on its carriage. This will give confidence to the gun detachment, and quick firing will result from the recoiling-barrel system. If we enter the fight without shells and the enemy carries them, it is as if one fenced with the upper body naked against an opponent swathed in padding, arm-protecting bandages, etc. The men on the ammunition wagons must be similarly protected. (See the Report under FRANCE.) It is certain that no State will introduce recoiling gun *carriages* until the recoiling-barrel system has been well tried.

The Field-Howitzer question has not been decided by any country but Germany. It seems, as far as one can foresee, that where those of two different calibres cannot be taken into the field, one of medium calibre will be chosen.

Quick-firing fortress and siege guns have made more progress. (See under GERMANY.) For the direct fire of fortress guns armoured gun emplacements will be used, and in course of time armoured guns fighting will become a special branch of the Garrison Artillery duties.

ARTILLERY MATÉRIEL IN INDIVIDUAL STATES.*

Austria-Hungary.—At present the actual field guns in use are the converted 9 cm. (3·54-inch) of 90, and of 75 for the fixed batteries. The reports of General Thiele's improved steel-bronze guns are favourable. The Ehrhardt and the gun-recoiling Skoda quick-firers were also tried in the presence of the Emperor:—

1. At 2,500 metres against a Field Battery scarcely visible in the open.
2. On the defensive repelling an Infantry close attack with ease.
3. In attack against a line of skirmishers at 2,200 metres with shrapnel.
4. With quick-fire shrapnel against Infantry within 1,500 metres.
5. Against well-covered Infantry with high explosives (Ekrasit).

The results were considered quite satisfactory.

* Full details of recent Field Artillery matériel on the Continent are contained in Captain L. R. Kenyon's papers in Vol. XXVIII., R.A.I. Proceedings, 1901-2.—E. G.

The heavy Howitzers (5·9-inch) with Ekrasit gave wonderful results against fixed objects. Lighter Howitzers of 3·937-inch calibre are, however, considered necessary as well as these. It is probable that in the Budget for 1903 new Field Howitzers and mountain guns will be estimated for. The heavy fortress guns are being provided with telescopic sights.*

Belgium.—The Cockerill-Nordenfelt Q.F. guns have not proved successful.

France.—Our prophecy in regard to the French Q.F. field gun with its steadiness while firing and the cover given to the men serving the gun by its shields has, as regards its influence on foreign artillerists, proved correct. They will bear in mind these advantages when selecting their Q.F. field gun. The French provisional Artillery Drill for 1901 gives certain details of this gun, which were also published in *Engineering* on 18th October, 1901.

The calibre of this field gun is 75 mm. (2·95 inch). Its weight is 370 kg. (7·283 cwt.), and its whole length 33 calibres (8·11 feet). Colonel Deport, the constructor of the gun, states in his report that he was the first really to verify the system of the axial recoil of the gun barrel on its carriage, and to devise a light gun, which is practically immovable in horizontal fire, and which will fire 20 rounds a minute, the weight of the shell being 13·9 lbs., and the muzzle velocity about 1,837 foot-seconds. A hydro-pneumatic break ensures the steadiness of the gun and carriage when firing, which is further secured by a spade under each wheel and one at the trail. The wheels of the gun carriage and limber are about 4½ feet in diameter. Some common shell as well as shrapnel are carried. The limber carries 24 shells and 3 men. The ammunition wagon carries 72 shells and 3 men. The total weight of the gun and limber is about 35½ cwt. The short 15·5-cm. (6·1-inch) guns and, according to report, some 22-cm. (8·7-inch) mortars form part of the heavy Field Army Artillery.

Germany.—The German Empire has armed its Artillery with two kinds of guns. The Field Gun of '96 and the 10·5-cm. (4·1-inch) Light Field Howitzer of '98. The former is intended for direct fire, but the latter can also use this, though primarily intended for high-angle fire. The heavy (5·9-inch) Howitzer of the Garrison Artillery are used as special Field and Position guns for heavy high-angle fire against entrenched positions from concealed emplacements, and they are not as a rule attached to the Divisions as the Light Field Howitzers are.

* The writer does not mention the interesting fact noticed in Major Nicholls' Prize Essay that some 9·45-inch Howitzers made by Skoda of Pilsen, in Bohemia, were sent out to South Africa by the British Government.—E. G.

General von Hoffbauer, formerly Inspector-General of Field Artillery, entered into a discussion regarding these in a pamphlet published in Berlin in 1901.

Krupp's new gun-barrel recoiling field-piece has been much approved of. Its barrel recoils in its steel cradle with the break-cylinder attached. It has steel shields and (with these) weighs, when ready for firing, 19 cwt., and with limber about $34\frac{1}{2}$ cwt. It fires 24 rounds a minute. The simplicity of all its parts, and its having only one spade attachment, are great advantages.

When the China expedition took place it was necessary to include mountain guns in the German Artillery system. Two 7-cm. (2.75-inch) Batteries were purchased from Krupp in Hong-Kong, and handed over to their detachments at Tientsin, and they were carried by American mules. They fired common shell and shrapnel, and stood the wear and tear very well. In future Mountain Batteries will form part of the Artillery establishment.

Great improvement has been made in the Garrison Artillery. As regards the use of heavy guns in the field greater stress is laid upon celerity in opening fire than in obtaining cover, but this latter must on no account be neglected as long as it does not delay the former. Cover for the detachments is first to be made, then for the guns. Sunken emplacements are generally used for heavy gun and mortar Batteries. Good observatories are of great importance. These are erected at the same time as cover for the guns is made.

The heavy Artillery of the Field Army, the siege trains, and the most important fortresses are armed with guns of the newest pattern, *i.e.*, the 5.9-inch Howitzer, the 21-cm. (8.3-inch) Mortar, the 10.5-cm. (4.13-inch) gun, and the long 15-cm. (5.9-inch) Ring gun. The latter is a quick-firer with hydro-pneumatic break. Its common shell weighs about 39 lbs., and its shrapnel about 39 $\frac{1}{4}$. The muzzle velocity of these is 1,923 foot-seconds,* and it has long-range penetration, great and bursting effect. Removable steel shields are affixed to protect the men serving the gun.

A heavy Howitzer Battery has 6 Howitzers, 12 ammunition wagons, 1 observatory wagon, provision field forge, etc.—total, 24 wagons. 4 Batteries form a Heavy Artillery Battalion.

The 21-cm. Mortar Battery has 4 mortars and 33 carriages (including observatory and mortar bed wagons). 2 Batteries form a Battalion. For the protection of the guns of defence, revolving armoured turrets and limber shields are carried. The former are armed with Q.F. guns.

* It is not stated whether nitro-glycerine or nitro-cellulose powder is used to produce the muzzle velocity given, which, of course, varies accordingly. The latter powder gives higher velocities, and I believe the Germans now use it.—E. G.

The heavier Q.F. guns carried by the Navy are at present 11-inch guns. Maxim machine guns are now regularly part of the service equipment. There are already 5 Machine Gun Batteries of 6 guns and 2 ammunition wagons each, and in October this year 7 more Batteries are to be added. They can be fired either from the travelling carriage or from a low kind of platform, the men lying down. These Batteries are attached to the Cavalry or Infantry Divisions, with some kept back with the reserve of the Army.

Great Britain.—The writer describes the Artillery of the British Forces and their armament, well known to our readers. He brings to notice the Prize Essay of Major E. G. Nicholls, R.A., in the *Royal Artillery Institution Journal*, giving the chief requirements of field guns deduced from the South African War experience as :—

1. A very light mobile Q.F. field gun for Horse Artillery.
2. A *Light* Field Howitzer for the Field Batteries.*
3. A mobile but effective Q.F. field gun for general purposes.
4. A Light Siege Howitzer carrying 80-lb. shell.
5. A Heavy Siege Howitzer carrying 250-lb. shell, but capable of movement with the train.

The Light Siege Howitzer should not weigh more than 3 tons behind the team.

Field Howitzers to range to 3,000 yards ; Siege Howitzers to 10,000 yards ; guns for Horse and Field Artillery to carry shrapnel only. Light Field Howitzers to carry half shrapnel and half common. Siege Howitzers to carry lyddite shells only. All to be capable of firing with high elevation.

The article in the *Monthly Review* by "Galeatus" is quoted by the writer, who says the spade arrangement for our field guns, designed by Sir Geo. Clarke, worked well in practice, and who pointed out the difficulties thrown by the Government in the way of private firms like Armstrong and Vickers-Maxim, which were quite capable of supplying the wants of the Army if reasonably treated. He says the fact of our having 16 different kinds of guns, Howitzers and machine guns in the late war is a proof of our unreadiness for war, and quotes Wille, who says that in no other Army are so many patterns of guns still in the Service. They amount to 154. Wille points out the mischief of this.**

* This officer and other Artillery officers of experience think our 5-inch Field Howitzer too heavy for mobility without shell-power sufficient to compensate for this.—E. G.

** The 5-inch medium (as now called) gun, weighing with its carriage $4\frac{1}{2}$ tons, also did good service in South Africa from 3,000 to 8,000 yards range, but some Artillery officers prefer the Q.F. 4.7-inch gun as a useful medium gun for Heavy Batteries. It weighs 4 tons behind the team. Nine different types of field guns of British make are to be experimented with this year in England, so it is to be hoped that some decision will be come to, and this chaotic state of things remedied.—E. G.

Italy.—The new Italian field gun is the 75-mm. (2·75-inch) steel gun. The gun is 32 calibres (7 feet 4 inches), has 32 grooves, and weighs about 7 cwt. The total weight unlimbered is about 20 cwt., and with limber and ammunition about 34 cwt. Common shell as well as shrapnel are carried. The gun has the spade arrangement for checking the recoil on firing. Fuller details are given in the Report, for which we have not space. A new Field and Horse Artillery Drill Book has been provisionally issued.

The Netherlands.—At present the Horse and Field Artillery are armed with the 8·4 cm. (3·3-inch) Krupp gun. The Siege Artillery have guns of 8 cm. to 30·5 cm., and mortars of 10 cm. to 15 cm. In the summer of 1900 experiments were commenced with Q.F. field guns, a selection from which has not yet, however, been made.

Russia.—By an Imperial Decree of the 22nd May, 1901, the Tsar decided to arm the Field Artillery with the Q.F. 3-inch gun (Mark 1900), of which the drawings and details were laid before him. This is the pattern recommended by General Ingelhardt.* It is a barrel-recoiling gun with hydraulic brake with interrupted screw breech action, to the use of which the Russian Field Artillery are accustomed. The projectile is given a muzzle-velocity of 2,000 f.s., a new departure in Russia. The Heavy Artillery of the Field Army is to have the 10·67 cm. (4·2-inch) heavy gun. The Siege Artillery have a gun of like calibre, but of greater power. The siege train has also light and heavy 15·25-cm. (5·97-inch) guns, light 20·32-cm. (8-inch), 8·69-cm. (3·4-inch) mortars, 22·86-cm (9-inch) mortars, and 8-inch mortars.

Spain.—After various trials with St. Chamond, Vickers-Maxim, Schneider-Creusot, and Krupp guns and carriages, the Select Committee reported in favour of the St. Chamond carriage, and the Maxim-Nordenfelt breech action. The 7·5-cm. (2·95-inch) Maxim-Nordenfelt barrel-recoiling quick-firer was also tried with its 14-lb. shell. The final decision of the Committee is not yet known, but French sources state that the greater part of the orders for new guns is to be placed with the French firms, though the limbers and ammunition wagons are to be ordered from Krupp.

Sweden and Norway.—After the trials between the Cockerill-Nordenfelt Q.F. guns and the Krupp gun mounted on a spade-recoiling gun carriage had resulted in the selection of the latter, experiments were made with Ehrhardt,** Schneider, and Chamond guns. The two latter

* See extracts from the Report for 1900 in the JOURNAL for October, 1901.—E. G.

** These are similar to those purchased by the British Government during the South African war. They are fairly well spoken of. (See JOURNAL April, 1901, p. 465, and October 1901, p. 1213.)—E. G.

firms were excluded, because they could not bring the total weight of the gun and carriage down to $18\frac{1}{2}$ cwt., the maximum allowed.

The Ehrhardt was to have made certain improvements demanded by the committee, but the firm did not do so. The trials were, therefore, confined to different patterns of Krupp guns. The carriage-recoiling gun with spade attachment fired 8.11 shots per gun per minute in battery against 7.4 rounds per minute by the barrel-recoiling gun.* It is not yet decided which system should be adopted, nor were all the results of the experiments published when our Report went to press.

Norway.—Trials were also made here with Ehrhardt and Schneider guns. The Ehrhardt gun was then decided on, though a number of improvements (chiefly in the carriage, the spade, etc.) were required by the committee. The improved Battery was to be ready by September, but meanwhile 21 Batteries of 6 guns each on this system with the Nordenfelt breech action were ordered by May, 1902. The improved trial Battery was delivered in November and experimented with.

Switzerland.—After a series of trials in the course of November, 1901, with Q.F. guns supplied by Krupp in Essen, Skoda in Pilsen, Schneider-Canet in Creusot, Cockerill-Nordenfelt in Senning, and (Ehrhardt) by the Rhine Metal and Machine Factory in Düsseldorf, the Select Committee of the Swiss Government reported in favour of ordering a battery of 4 barrel-recoiling Q.F. guns on the Krupp system with 2 ammunition wagons having all the latest improvements, to undergo searching trials in August, 1902, so as to decide whether these or the carriage recoiling, spade attachment gun shall be adopted. The former guns have been described under the heading Germany. This is a great triumph for Krupp, as in Switzerland many were in favour of the Schneider-Canet system, which is practically a copy of the new French Q.F. field gun. No decision has been come to about Field Howitzers.

FIELD FORTIFICATION AND ENGINEERING IN 1901.

Captain Durset, of the French Army, proposes to alter the shape of shelter trenches to give effect to the principle that the easier the position of the soldier in firing the better he shoots, and as the kneeling position is so uncomfortable he would increase the breadth of the fore part of the trench, which is about 8 inches deep from 12 inches to 1 foot 8 inches, so as to facilitate the sitting position under cover of the parapet, which is 1 foot 4 inches high. The measurements are too small. Instead of 8 inches deep, the trench must be at least 1 foot 4 inches deep to rest the feet in

* This pattern gun slides back in its cradle on recoil, and has a telescopic trail, of which the inner tube is drawn out to full length when the gun is in firing position.—E.I.G.

while firing in the sitting position, and the seat should be 2 feet 3 inches below the top of the parapet to obtain proper cover. The profile of the French proposed trench 45 cubic metre (about 16 cubic feet) is less than that given in the German Manual of Field Fortification, which is about 20 cubic feet and more. Field-firing experiments against intrenched positions carried out on the Veszprim ranges near Hajmasker in Austria confirmed previous experience that shrapnel shell was of little use against troops under good cover, but that common shell was effective. The weak point of all such practice is that the defenders do not fire. Were it arranged that they should do so, while the attacker is approaching the position and preparing the attack, the results might be different.

THE PASSAGE OF RIVERS.

Since the introduction of heavy field artillery, military bridges require to be made, as every Army will carry with it heavy position guns, although it is only in exceptional cases that it will have siege guns with it. Yet mobility is more than ever necessary. The bridge-train no longer fulfils the obligation of being able to bridge streams of the moderate width of 200 metres. Having regard to the increased strength of material necessary to carry heavy guns, the Corps bridge-train has been shortened to 120 metres. This can be increased to 150 metres if Captain Meyer's proposal to add one trestle wagon to each divisional bridge-train be followed. The Report here goes into details comparing the Austrian and Russian systems, which it says are unfavourable to the latter, the wagon boats being 50 centners (49 cwt.) against 42 centners (41 cwt.) of the Austrian and French wagon loads. Two four-horsed wagons should be substituted for the present one to six-horsed wagons. It is of the greatest importance that the commanders of the bridge-train units should be acquainted with the object and intentions of the commander of the forces, so that they may give him their technical aid to best advantage.

Cavalry have been much practised of late in swimming across rivers, for it will never do to allow a river like the Moselle to put a stop to the advance of Cavalry, as happened in 1870, because they had no means of crossing. But every man cannot be an expert swimmer, and it suffices if a certain number in every squadron are so instructed. The Infantry Regiment No. 125 practised crossing the Neckar in 1901 near Münster. For non-swimmers two stout ropes were passed across the river, here 30 metres wide, and secured on the left bank. The non-swimmers passed over these by four at a time, the swimmers pushed before them while swimming their kits fastened up in a bundle of tent canvas, their rifles being laid on the top. Each company took 20 minutes to cross. In England they use a new boat raft 18 feet long, divisible into four

sections, each weighing a little over 1 cwt. One mule carries two sections. When put together, each half of the apparatus can carry a field gun and limber.

MILITARY COMMUNICATIONS OF THE PRESENT DAY.

These may be considered under the two heads: (a) the transmission of intelligence; (b) the means of transport:—

- (a). 1. Foot messengers.
- 2. Officers or men on bicycles, on horseback, in different kinds of carriages, or in balloons.
- 3. The field telegraph, wireless telegraphy, the cavalry light telegraph, telephone, etc.
- 4. Optical or sun telegraph light signals, etc.
- 5. Homing pigeons and war dogs.
- (b). 1. The heavy train-wagon columns
- 2. Pack carriage
- 3. Motor carriages and wagons
- 4. Locomotive trains
- 5. Light railways and tramcars
- 6. Steam-ships.
- 7. Sailing-ships.
- 8. Towing-boats.

} Running along roads.

} Running along rails.

Germany is well provided in this way, but other nations have not been idle. The writer goes into details regarding each of these, which we have not space for. He gives some regarding bicycle messengers, which are of interest. Cyclists, he thinks, are preferable to horsemen on good roads, they can do 30 kilometres (18 miles) in an hour. The delay stations can be 30 miles apart.* They have, therefore, been provided in Germany. In FRANCE each general in command has 19 cyclists at his disposition, each Infantry Division 11, the Cavalry Divisions 7, each Infantry or Cavalry Brigade 2, the staff of an Infantry Regiment 4, each Infantry and Rifle Battalion 3, and each Cavalry Regiment 2. The technical units have also a proportion. As a rule, folding bicycles are used. It is a moot point if these are the best. They can hardly be as strong as rigid ones.

Motor Cars.—By the introduction during the last few years of light and very rapid *Motor Cars* the service of Reconnaissance and of keeping up quick communication between commanders and their troops has been much facilitated. The writer goes into details of the various kinds of motors, which we have not space for. They have been reported in the JOURNAL from time to time. The heavy racing and roadster motors now

* These distances seem somewhat long. The proportion of cyclists allowed in Germany is not given.—E. G.

used for sporting purposes and carrying from 4 to 6 persons will play an important part in war, the writer says, especially for keeping up communication between detached bodies and the Head-Quarter Staff of Armies. They attain a speed of from 40 to 50 miles an hour, with a weight of 3 cwt. per H.P. He does not especially bring to notice any particular patterns of automobiles tried in 1901.

Balloons, other than captive, require, he thinks, too many favourable conditions to be of reliable service as yet for military purposes.

Pigeons.—These birds well trained attain a speed of 40 miles an hour, and can fly at a height of, on the average, 1,000 feet. Though liable to much hindrance from bad weather, birds of prey, etc., a fair proportion arrive, and they are useful when taken up in balloons and tossed. They will of course only fly straight home.*

The Optical Telegraph.—The immense use of this in war has been proved in the South African War.** As a strategic means of communication it is of an importance which must not be underrated, and the more difficult the situation, the greater the consequence of this method of telegraphing. The rapid way in which this method can be established by day and by night, and the distance to which it is effective (60 miles) and its simplicity, above all its being often the only means of communication between detached bodies of troops by sea and land, make it the surest and most rapid means of attaining the desired object. Its use by detached Cavalry, advanced guards, outposts, etc., and for innumerable purposes, is evident.

In battle its use is confined to short pre-arranged signals, but may be of great value in determining a timely use of reserves on a slacker resistance of the enemy being reported, etc.

The Mance Heliograph system is generally adopted by all nations. Powerful Fresnel lenses are used for lamp signalling, and many sources of light petroleum, acetylene, lime-light, etc., are used. The Morse Code is generally employed.

The training of the *personnel* of the Signalling Staff is of the highest importance. The greatest care must be taken with the early instruction, and the officers and men must be constantly exercised to keep in practice. It is necessary that the officers and non-commissioned officers in charge of signallers should be well practised in map-reading, in finding their way with chart and compass in unknown country, especially by night, and should have much self-confidence. The writer speculates upon what

* It will be regrettable if the training of homing pigeons for the British service is abandoned.—E. G.

** The writer is probably aware that this method of signalling has been in use in our Army for many years.—E. G.

would have happened in the 1866 and 1870 campaigns had the heliograph been available.

The Report states that particular attention has been paid to Army Signalling in the United States of North America. The Signalling Corps consists of 1 brigadier, 1 colonel, 1 lieut.-colonel, 4 majors or captains, 14 first lieutenants, 200 sergeants, 150 corporals, 400 privates. This costs \$800,000 (£160,000).

It details the organisation of Signalling Companies, etc., in the British Army, with which our readers are well acquainted, and gives some account of the signalling arrangements in fortresses.

Steps have been taken in Germany since the first experiments with Professor Herz's ether waves to carry on progressive trials in the application of these and of the Marconi system to military purposes. It appears this can be advantageously used for connecting the Advanced Cavalry and the Divisions with the Corps Head Quarters. Further ahead than the former the Flash-Telegraph—as they call it—can hardly be used as yet, as the signallers are so liable to interruption by the enemy.

This system is also liable to electric and magnetic disturbances, as well as to the interference of cross-rays from similar apparatus. It cannot be reckoned on for a higher rate than 150 words an hour. As captive balloons are necessary to carry the apparatus up a sufficient height, this method of telegraphy has in Germany been handed over to the balloon sections.

The question of FREE BALLOONS, of course, depends upon the possibility of steering them. The solution of this problem can only be made by those thoroughly grounded in mathematical science and physics. Unfortunately, much of what is mere charlatanism has crept into the development of this question.

For the present the Captive Balloon, with good arrangements for conveying intelligence of what is seen from it, is the most reliable method of observation.

War Balloons.—The Report gives an interesting tabular statement of the organisation of War Balloon Sections, etc., in Austria, France, Germany, Great Britain, Italy, Spain, the United States, and in some of the smaller Armies, but there is not space to transcribe this. Some account was given of these in the JOURNAL for February, 1900, p. 161. Austria, France, and Russia seem to have made more additions to their balloon establishments than other foreign Powers since then.

MILITARY TRANSPORT.

“On the average about 10,360 tons per mile are required for an army of 100,000 men moving about 67 miles from its base.” These and

other interesting and useful calculations are given in the excellent chapter on Transport. But, as this occupies twelve closely-printed pages, and as British officers have had more recent experience in various kinds of transport than those of any other Army, it is not thought necessary to reproduce it to the exclusion of other matter.

CONTEMPORARY MILITARY HISTORY.

The historical section for 1901 comprises an interesting and complete account from the German point of view of the Boxer Rebellion and the expeditionary forces from 27th September, 1900, to the end of December, 1900. A sketch-map accompanies the Report, which, it is much to be regretted, cannot be epitomised here for want of space. A general account of the occurrences in Southern China adds to its interest. The contributor, Captain Loeffler, says the German nation has every reason to be satisfied with the part played by Germany in the China expedition and with its results.

An account of the Ashanti campaign in 1900 is also given, with a sketch-map, and every credit given to the leaders for their courage and determination.

Military Literature.—Space considerations forbid more than a passing glance at some of the works mentioned in the Report for 1901. The numerous works still published on the Franco-German War are perforce omitted, excepting:—

La Guerre de 1870-71, published by the Historical Section of the French General Staff (Paris) in 1901, described as not a history of the war, but a sort of military chronicle of events, with copies of the orders, field states, letters, and memoranda of the various commanders. This first part was reviewed in the JOURNAL for June, 1902, p. 853.

La Bataille d'Adua. By Lieut.-Colonel Petetin. Paris.

Kriegsgeschichtliche Beispiele aus den Kriegen der neuesten Zeit (up to 1898). By Major H. Kunz. Berlin.

La Guerre au Transvaal. Vol. II. By Lieut.-Colonel Painvin and Captain Frocard. Paris.

Der Krieg in China. By General Paul von Schmidt. Berlin. The Report says that the English publications on the Boer war are too voluminous to be even mentioned. A list is given in the *Militär-literatur-Zeitung* (*Wochenblatt*), Nos. 7 and 8 of 1901.

Meine Erlebnisse und Erfahrungen im Buren Kriege. By Count Sternberg. Berlin. The Report says the Count's narrative is influenced by his situation in regard to the British Head-Quarter Staff, Colonel Henderson, the Chief of Lord Roberts' Staff, having written a preface to his book when translated into English.*

Unter dem Rothen Kreuze im Buren Kriege. By Dr. Suter. Leipzig. Gives some interesting medical and other details. Dr. Suter, a Swiss Army surgeon, was with the Swiss ambulance in the war.

Besides the above mentioned, it may be well to name some of the books brought to notice in the Report and classified under their different branches, but there is no space available here to enumerate more than a very few.

INFANTRY TACTICS.—*The Tactics of To-day.* Major Callwell, R.A. Blackwood.

Militärische Betrachtungen über den Krieg in South Africa. *Militär-Wochenblatt*, Beiheft No. 8. A retired German artillery officer.

The Attack of Positions on High Ground. *Militär-Wochenblatt* Nos. 19-20. Lieut.-General Rhone.

The Co-operation of Artillery with Infantry. Lieut.-General Rohne. Mittler, Berlin.

Règlement sur l'Exercice de l'Infanterie, 1901. Ministère de la Guerre. Paris.

Das Exercir-Reglement für die K. K. Fusstruppen, 1901. Seidel & Sohn. Vienna.

Die taktische Verwendung, etc., der Deutschen, Oesterreichischen, Italienischen, Französischen und Preussischen Armeen. Von Regenspurski. Major Balck. Eisenschmidt. Berlin.

Les Principes de la Guerre Alpine. F. Simon, Capitaine d'état-major. Berger-Levrault. Paris, 1901.

* This book was reviewed at length in the JOURNAL for February, 1901, p. 225. Count Sternberg was a correspondent with the Boer forces, and was taken prisoner before Paardeberg. He praised the British officers, by whom he was well treated; but as he was sent to England at once, and his book was published shortly after, it can hardly have been influenced as stated. Colonel Henderson, though on Lord Roberts' Staff, was not Chief of the Staff.—E. G.

CAVALRY TACTICS.—*Der Freiheitskampf Nord Americas und der Burenkrieg. Militär-Wochenblatt, Beiheft No. 8.*

Cavalry Scouts. United Service Magazine, September, 1901.

ARTILLERY.—*Englische Artilleriewirkungen im S. A. Kriege. Militär-Wochenblatt No. 35.*

Die Verwendung der Schnellfeuer Geschützen. Jahrbücher, October, 1901. Lieut.-General Rohne.

Die Pompoms im Transvaal Kriege. Neue Militärische Blätter, XVIII., p. 27.

SMALL ARMS.—*Das Inf. Gewehr der Zukunft. Allgemeine Schweizer Militärische Zeitung No. 29, 1901.*

Les Armes à feu portatives de Guerre. Revue d'Artillerie, August, 1901.

ARTILLERY MATÉRIEL.—*Waffenlehre. General R. Wille. 2nd Edition. Berlin, 1901.*

Der Kampf um die moderne Feldgeschütze. Anonymous. Berlin, 1901.

Studie über Schnellfeuer Geschütze. General H. Rohne. Berlin, 1901.

Die Französische Feld-Artillerie. General H. Rohne. Berlin, 1901.

HISTORICAL, GENERAL, ETC.—*Militär-Lexicon (with short description of the Wars since 1618, with maps and plans, and a list of works bearing on the same). Lieut.-Colonel Frobenius. Berlin, 1901. £25.*

Studien über Kriegführung auf Grundlage des amerikanischen Secessions-Krieges. Major Freiherr von Freytag-Loringhoven. Berlin, 1901.

Moltke's Vermächtniss. General von Schlichting. Berlin, 1901.

OBITUARY.

Colonel Heinrich von Löbell.—It is fitting that the name of the distinguished originator of these Reports should head the list of deceased men of mark, which this year is not a long one.

He was born at Bermberg in 1816, the son of a major in the Prussian service, who died in 1822. He obtained his commission in the Artillery from the Berlin Cadet School in 1833. His career was almost entirely devoted to study, to teaching, to science, and to literature. In 1848 he was appointed to the Artillery section of the War Office. He became captain in 1850. In 1852 he was appointed lecturer in the Artillery and Engineer School, and Member of the Ordnance Select Committee. He sat on several committees connected with the technical education of officers, and in the winter of 1862-3 was associated with von Moltke, who was Chief of the Staff on the Cadet Corps Commission, and in 1864 he was promoted full colonel in the Artillery. From '67 to '75 he was lecturer at the Staff College. He was appointed chief of the Schleswig Regiment of Artillery, and then retired in 1866. He was an extremely busy man, and only wrote one actual book, "The History of the Needle-Gun and its Rivals." But in 1866 he founded and edited the existing *Jahrbücher*, and contributed to many technical periodicals. As far back as 1851 he had contemplated the establishment for the military art of a periodical which should embrace all important changes and progress in the Armies of the chief European States, but it was not until Dr. Toeche, the head of the firm G. S. Mittler and Son, co-operated with him in the work, that the "Report" made its first appearance in 1875. He edited and conducted it till 1891, and it was chiefly to his zeal, industry, judgment, and never-failing courtesy to his collaborators that the publication owes its success. He also edited the *Militär-Wochenblatt* and *Litterär-Zeitung* from 1880 to 1889. He died at Pankow, a suburb of Berlin, on 18th October, 1901, aged 85.

Lieut.-General O. Baratieri. — This Italian officer, better known through his misfortune in Abyssinia at the battle of Adowa, in February, 1896, than from his earlier and more fortunate service, was born in November, 1841. He served under Garibaldi in 1860, and in 1866 in the Tyrol. After being military attaché to the Embassy at Berlin, he was sent in 1887, when a colonel, to Africa, where in 1891 he was appointed Governor. In 1893 the Dervishes invaded the country, and in 1894 the Mahdi advanced on Kassala. Baratieri defeated him and occupied Kassala and Adowa. In January, 1895, he repulsed the attacks of Ras Mangescha at Kawatit and dispersed his forces by a surprise at Smafé, and enlarged the Italian border. For this he was promoted lieut.-general over the heads of many officers. By February, 1896, Menelik had marshalled from 80,000 to 100,000 warriors to put a stop to his advance, whereas Baratieri could only muster from 14,000 to 15,000 men, though reinforcements amounting to 10,000 were on the way from Italy, some of which had already landed. The general had to decide whether to retreat, to join forces with these, or to fight a decisive battle with the troops he

had. Unhappily for him he chose the latter course, impelled thereto doubtless by the circumstances of the Prime Minister, Signor Crispi, who required a victory to maintain his position. His own ambition and regard for the bad moral effect of a retreat on his troops also influenced him. He did not intend to attack, but to take up a position where he could await events. But the enemy fell upon him with overwhelming odds before he could effect this, and surrounded his force, which was compelled, after heroic efforts, to retreat in disorder. He was recalled and replaced early in March, 1896, by General Baldissera. He was tried by court-martial in June, 1896, but acquitted. Yet so crushing was the opinion pronounced by the court in regard to his capacity and his measures that he had to retire. He published a vindication of his conduct in Erythrea in 1899, called "Memories of Africa from 1892 to 1896." He died at Sterzing in August, 1901.

Lieut.-General Basil Gras.—The designer of the Gras rifle was born at St. Amand in January, 1836, educated at the Polytechnic School, entered the Artillery as sub-lieutenant in 1858, became captain in '64, colonel in '82, brigadier-general in '88, and general of division in '94. He was through the campaigns of 1859 and 1870, but it was chiefly owing to his technical ability that he was distinguished. In 1864 he was appointed to the Small Arms Factory at Tulle. Then he was appointed instructor at the Châlons Normal School of Musketry. In 1874 his recommendations led to the substitution of the Gras rifle for the Chassepot, which lasted till 1886, when the Lebel rifle took its place. The chief changes he introduced in his rifle were in the breech, and the substitution of a metal cartridge for the old *papier-maché* one. He replaced by a sword-bayonet the old straight-thrust bayonet. He was head of the Small-Arms Factories from 1882 to 1891. Then, till 1894, he commanded the artillery of the 6th Army Corps. After this he was appointed Inspector of Artillery Factories and Member of the Ordnance Select Committee, of which in 1899 he became President. He died at Chablis in April, 1901.