



Colonel v. Löbell's Annual Reports Upon the Changes and Progress in Military Matters During 1888

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COLONEL V. LÖBELL'S¹ ANNUAL REPORTS UPON THE
CHANGES AND PROGRESS IN MILITARY MATTERS DURING
1888.

Compiled by Colonel H. HILDYARD.

THE present publication is the fifteenth issue of Colonel von Löbell's valuable military compilation, a work that has done more than any other published in or out of Germany for the student of contemporaneous military matters. As year follows year, the regular appearance of Colonel von Löbell's well-known green book is welcomed throughout the military world, as a trustworthy guide and record regarding every change of any importance, whether it be in the organization or the administration of armies, in their armament or equipment, or in the ever-varying phases of the tactics employed by the several arms. The detailed manner in which each of these subjects is treated, while enhancing in a high degree the intrinsic value of the work, has the single disadvantage that its bulk has hitherto stood in the way of a complete translation being made of it into our own language. It is the object of the present précis to remedy in some degree this disadvantage, by placing within reach of those who are debarred from consulting the original a short summary embracing those points that appear to be of particular interest. But in doing this we would again urge those Officers who are acquainted with the German language—and they are happily a constantly increasing number—not to content themselves with this necessarily imperfect abstract, but, on the contrary, to make a serious study of the work in the original.

The same arrangement has been followed in the latest volume as in previous years. The first part treats of the individual armies of Europe, and elsewhere, Asia, Africa, and America being each in some degree represented. This part forms the largest portion of the work, and occupies 300 pages. Of these, Germany monopolises 40, France 39, Italy 37, Russia 32, and Austria 24, the remainder being distributed over a number of States in all parts of the world. Amongst these may be noticed the Congo State, the armed forces of which are recorded as not without interest at a time when Colonial enterprise has so many sympathisers.

The second part deals with the several branches of the art of war. It embraces the tactics of infantry, cavalry, field artillery, and fortress warfare; the development of small arms and the situation of each of the European armies in regard to the re-armament of the infantry; the progress of military telegraphy between 1886 and 1888; and, lastly, a record is given of the military literature published during 1888.

The third and concluding part embraces ordinarily an account of the military operations conducted during the year. But on the present occasion there are none considered of sufficient importance to warrant special record here, though elsewhere the late operations at Sikkim and the Black Mountain Expedition are briefly referred to. The third part is therefore restricted this year to the obituary notices of General and other distinguished Officers,

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irrespective of their nationality, whose death was recorded during the year 1888.

Turning back now to a closer consideration of the first part, we find the foremost place is given, as is natural, to the German Army.

Germany.

New Organic Law.—It was the privilege of the Emperor William I, before his death, to affix his signature to the law of the 11th February, 1888, by which provision was made for a material increase to the armed forces of the Empire. The following brief abstracts show the more important of its provisions:—

Article I.—The first sentence of the fifty-ninth article of the constitution of the German Empire, dated the 16th April, 1871, contains the following provision:—Every German capable of bearing arms belongs to the standing army for a period of seven years, as a rule; from the completion of his 20th year till the commencement of his 28th year—the first three years with the colours, the last four years in the reserve—the following five years to the 1st levy of the Landwehr, and then till the 31st March in that calendar year in which the 39th year of his age is completed, to the 2nd levy of the Landwehr.

Article II. First Section—Landwehr.—The Landwehr is divided into two levies. The obligation to service in the 1st levy of the Landwehr is of five years' duration. The entry into the 1st levy of the Landwehr follows upon the completion of the period of service in the standing army.

The obligation to service in the 2nd levy of the Landwehr lasts until the 31st March of that year in which the 39th year of age is completed.

Article II. Second Section—Ersatz Reserve.—The Ersatz Reserve serves to complete the standing army on mobilization, and to form the units of the Ersatz formations.

Each year so many men are to be allotted to it that the first requirements for the mobilization of the army will be met by seven yearly classes. In the first place, those individuals are to be allotted to it who have been found qualified for military service, but are surplus to the required quota for the colours, through having drawn high numbers.

The further requirements are to be provided from those fit and liable to service who have been exempted from duty with the colours for family reasons, those who have been found conditionally fit and exempted for minor physical defects, and those exempted for temporary unsuitness, but who are likely to become efficient.

The Ersatz Reserve men can be called up once yearly to report themselves at the Recruiting Boards that are assembled in the spring. In time of peace they are liable to be called out for drill three times during their service: on the first occasion for a period of ten weeks, on the second for six weeks, and on the third for four weeks. The numbers to be called up to the first drill are fixed in the Estimates. The period of service in the Ersatz Reserve lasts twelve years, dating from the 1st October in the year in which the men become liable to military service. On the expiration of this period the Ersatz reservists who have been trained are passed to the 2nd levy of the Landwehr, and the remainder to the 1st levy of the Landsturm. The division of the Ersatz Reserve in two classes, which has hitherto prevailed, is abolished, and the whole of the men formerly attached to the 2nd class are in future to form part of the 1st levy of the Landsturm.

Fourth Section—Landsturm.—The duty of the Landsturm, in the event of war, is to undertake the defence of the Empire; in cases of extraordinary emergency it can be drawn on to complete the army and navy. It comprises

all men liable to service from the completion of their 17th year up to 45 years of age who belong neither to the army nor the navy. The 1st levy is composed of those liable up to the 31st of March of that year in which they complete their 39th year. The remainder belong to the 2nd levy, which includes those who have completed their term in the army and Landwehr, and who continue in it until they attain the age of 45. The Landsturm is called up by Imperial decree, but in the event of sudden emergency, this may be done by Generals Commanding, by Governors, and Commandants of fortresses. So far as the military circumstances allow, the men are called out by yearly classes, beginning with the youngest.

Training and Manœuvres.—The new infantry drill-book was issued to the troops on the 1st September, 1888, and was made applicable to the whole of the infantry, including the Jäger and Schützen battalions. On the 15th October, 1890, the Generals Commanding army corps and the Chief of the Staff are to submit their reports to the Emperor upon the experience of the new drill regulations.

New musketry regulations have been issued applicable to the cavalry and the train.

Prizes for good shooting have been instituted for Officers and non-commissioned officers. For the former the prize is a sword, for the latter a watch, one of each being given in each army corps. All Captains and Lieutenants in garrison at the time fixed for the firing have to take part in the competition.

For the manœuvres in the autumn of 1888, the Guard Corps and the 3rd Army Corps were detailed for manœuvres before the Emperor, consisting of a grand parade and corps manœuvres against a marked enemy—each army corps separately—and then three days' manœuvres one against the other. Each of these army corps formed also a cavalry division of six regiments, with two horse artillery batteries for special cavalry manœuvres; but these joined their respective army corps during the period of the Emperor's manœuvres. The rest of the army corps followed the course of autumn manœuvres laid down in the Regulations for Field Duties. In seven of them cavalry long distance rides were practised. A pontoon exercise took place between Thorn and Graudenz, and a siege exercise at the latter fortress, each lasting for fourteen days.

Training of Reserves and Landwehr.—The number of men who had left the colours called up for drill in connection with the manœuvres during 1888 was as follows:—

From the Reserve—	Men.
Infantry of the 1st, 2nd, 5th and 6th Corps	61,500
Balloon detachment	40
From the Reserve and Landwehr—	
Infantry of the 4th, 7th to 11th, 14th and 15th Corps	40,700
Jägers and rifles	2,800
Field artillery	7,500
Garrison artillery	3,800
Pioneers	2,300
Railway regiment	400
Train	4,683
Total Prussian corps	123,723
And of the Bavarian corps	22,184

Grand total Army Reserve and Landwehr 145,907

The duration of the drills was twelve days, excepting in the case of the balloon detachment, who were up for twenty-eight days.

The number called up from the Ersatz Reserve was:—

	Men.
For a first drill of 10 weeks.....	12,000
„ second drill of 6 weeks	10,700
„ third drill of 4 weeks.....	10,250
Total Prussian corps	32,950
And of the Bavarian corps	4,810
Grand total of Ersatz reserve	37,760

The general total, therefore, of the Army Reserve, Landwehr, and Ersatz Reserve called up for instruction during the year 1888-89 was 183,667 men.

Belgium.

The Meuse Defences.—A first credit of 8 millions of francs was taken in 1887 for the construction of fortified bridge-heads on the Meuse. A further credit of 12 millions was taken for the same purpose, besides 800,000 francs for the purchase of ground for a military road between the gorges of the forts. The total expenditure amounts to 33 millions for the forts, 20 millions for their armament and cupola towers, and 900,000 francs for the ground, making a total of 54 millions of francs.

The forts will be constructed according to two different types, each of which will, in a certain sense, be an ideal one. They will embody all the improvements realized both in the science of artillery and construction. The building of these forts has been entrusted to a firm, chiefly composed of Frenchmen, under a contract for their completion by the 31st December, 1890.

Military Establishments.—The zeal of Belgium in improving in every possible way the instruction of her small army is worthy both of notice and of imitation. Notwithstanding the large sums devoted to extraordinary credits for the important works of defence that have been undertaken, money has not been grudged for the enlargement of the artillery practice and experiment ground at Brasschaet, for which purpose a credit of 750,000 francs has been taken. The Infantry School of Musketry has also been reorganized with a view to the instruction being extended, so as to embrace fire tactics under service conditions.

Manœuvres also have not been neglected, two infantry Divisions, with other arms attached in proportion, having taken part in them, and occupied the two last days united as an army corps in the attack of a position marked by troops from the garrison of Antwerp. A cavalry Division, with two batteries attached, was also engaged in manœuvres for fourteen days.

At least once in every year all the mounted troops are exercised in entraining.

Mobilization.—During the discussion of the Budget for 1889, the Minister of War stated the number of men necessary for the defence of the country to be as noted below. He added that these numbers were actually available:—

	Men.
Field Army, consisting of 2 army corps and 2 independent cavalry divisions	70,000
Antwerp (including the mobile troops)	30,000
Termonde	4,000
Diest	4,000
Lüttich (including the mobile troops)	8,900
Namur (" " ")	5,000
Total force.....	121,900

In connection with the efficiency of this force, the deficiency in the number of Officers required is a matter for serious consideration. As many as 300 Officers are required to complete the war strength of the Army, and no less than 500 for the Reserve, which on paper numbers 30,000 men. An attempt was made to provide for these from Officers who had left the Service, and from non-commissioned officers; but this has not proved successful. Neither has, so far, another scheme, by which a new creation, to be termed "*volontaires agréés*," were instituted. These are enrolled as corporals, and, after an examination, become candidates for Officers of the Reserve. After six months' good service, and undergoing another examination, they are nominated to be non-commissioned officers—in which rank they serve two years before being nominated Officers of Reserve, if considered fitted for their position. They are then dismissed, being liable to be called up in time of war for the whole period of their engagement, and in peace-time for a month's training each year.

The institution is evidently a partial imitation of the German one-year volunteers, but the same excellent results are not to be expected from it, seeing that service in Belgium is not universal. It offers consequently no inducement to the high class of men who in Germany avail themselves of the opportunity offered them to avoid serving for the full legal period. The advantages offered, in short, are not very obvious, and a satisfactory solution of the difficulty existing in regard to Officers for the Reserve in Belgium cannot be expected to result from the course adopted.

Bulgaria and East Roumelia.

The development of the armed forces in this Principality continues, and with the new year the infantry underwent a material reorganization. Whereas it consisted previously of 12 regiments of 4 battalions each, the new organization is to be in 24 regiments of 3 battalions, which entails an increase of no less than 12 regimental staffs and 24 new battalions. A proposal was also made for the increase of the cavalry and artillery; but this was not approved by the Sobranje.

Denmark.

The chief interest continues to be the construction of the works designed for the defence of Copenhagen and its neighbourhood, for the continuation of which a further extraordinary credit was granted. During the year 1888 rapid progress was made with the construction and armament of these works, the condition of which is shown in the following summary.

1st. Works completed.—As regards the sea defences, the two coast batteries at Charlottenlund and Kastrup, regarding which the particulars were given in the Reports for 1886-87, have now been provided with their armament.

As regards the land defences, the works begun in 1886 and 1887, with the

object of preparing an inundation on the north and north-west fronts, are completed. An inundation, completely satisfactory from a military point of view, can now be created at short notice extending from Fresund up to the western part of the Utterslevmoor. This inundation is strengthened: partly on the right flank by the disposition of the Christiansholm battery, with the polygonal front appertaining to it, partly by four smaller flanking batteries lying behind the inundation, of which the two in Ordrukskrat are casemated, whereas the two batteries before Gjentoftø, each have four 9 c.m. guns, are provided with bomb-proof magazines, and have guns on the open rampart.

The two batteries at Thinghoi and Vangede, which cover the centre of the position, are finished, and were very shortly to be provided with the armour-protected quick-firing guns destined for them.

2nd. Works continued.—The fort of Garderhoi, commenced in 1886, was so far proceeded with that the whole of the casemate buildings were ready. Early in the spring of 1889, the armament, which is to be composed exclusively of armour-protected guns, was to be commenced by the fixing of a Gruson tower for two long 15 c.m. guns. It is estimated that in the course of the year the fort will be sufficiently completed to receive its entire armament, as soon as it has been decided what this shall consist of.

The fort of Gammelmoorgaard, begun in 1887, had its glacis laid out, the necessary excavations prepared for the most important casemate buildings, and the works of drainage and communication completed. By the end of the year the earthworks will be practically finished, and the masonry work can be proceeded with.

3rd. New Works.—These may be arranged in two groups: one includes works undertaken on the north and north-west fronts for the elaboration of the system of works already in existence. The other comprises entirely new works on the west front.

The former includes the construction of a new provisional battery on the Thinghoi plateau. The armament of this battery is to be four heavy and two light fortress guns mounted on the open rampart; and it is to be furnished with a bomb-proof magazine. The works were so far advanced by the close of 1888 that the masonry was completed, and the whole battery should have been finished during the spring of 1889. The battery is in conformity with the adjoining batteries of Thinghoi and Vangede in being furnished with a broad, shallow, planted ditch.

The Christiansholms battery also, the work on which was stopped provisionally in the summer of 1888, is now to be prepared, and armed with three short 15 c.m. guns with armoured carriages on Schumann's system. The foundations for these were to be ready in the spring of 1889. Besides these three guns, it is to be furnished with two 47 m.m. quick-firing guns, the whole being protected with armour. Quick-firing and machine guns with armoured protection are also to be provided for the batteries of Thinghoi and Vangede.

The new works on the west front consist in a connected enceinte from the west side of Utterslevmoor to Kjöge Bay. With this work will be completed the undertaking having for its object to provide Copenhagen with a connected protection against an attack from the Seeland side. The enceinte has a length of 14 kilometres, and consists of 23 fronts, of which 9 are to be on the polygonal system, and the 14 others on the Danish system. The character of the latter fronts is the result of a remodelling continued during many years, of a front construction suited to the Danish conditions, and by which is secured a complete polygonal flanking by means of bomb-proof caponiers in combination with a flanking defence from the rampart, as in the bastion fortification. A wet ditch, 20 metres broad, constitutes the

passive defence, and is exposed to a powerful and complete flanking fire, provided for as indicated above.

The works which could not be seriously commenced earlier than July, 1888, were pushed on with the greatest energy. Unless their progress should be interrupted, it is estimated that they should be finished by the autumn of 1889. The extent of the undertaking can be judged of by the amount of earth to be dealt with, viz., $2\frac{1}{2}$ million square metres.

Egypt.

The total strength is given as follows :—

471 Officers, of whom 54 are British, 417 natives.
518 officials.
8,642 non-commissioned officers and men.

The British Officers were distributed in the following manner :—

24 belong to the several battalions, &c.
4 form the staff on the frontier.
3 form the staff at Suakin.
8 belong to the Medical Service.
15 occupy special positions as head of departments or in the Ministry of War.

Exclusive of the staffs, the Egyptian Army was composed as follows :—

	Officers.	Men.
11 battalions of infantry (4 black, 7 Fellah battalions)	204	6,897
6 batteries of artillery	26	606
$2\frac{1}{2}$ squadrons of cavalry	19	465
2 camel corps	8	196
Total (24 British, 233 native Officers)....	257	8,164

These, together with the increase of 2,080 men recommended by the Sirdar, would place the total strength at 10,244 combattants.

France.

The Army budget for 1889 shows an increase of 15 millions of francs for the ordinary expenditure over 1888.

The sums placed at the disposal of the War Minister, as extraordinary credits, for the purpose of obtaining war material of all kinds, for the construction of new works and for strengthening of works previously in existence, reached a sum of over 770 millions of francs. Already more than $2\frac{1}{2}$ milliards had been devoted to the same objects; but the end of this extraordinary expenditure seems as far off as ever.

During the course of 1888 the peace strength of the army was increased, both by the creation of new formations and by the increase of the effective strength of these units. The new formations amounted to 1 cavalry regiment, 24 rifle companies, 12 companies of Algerian light infantry, and 16 batteries. By an alteration in the organization of the infantry regiments, 145 new battalions were added to the Territorial Army.

The increase of the rifle companies was introduced by a law dated the 24th December, 1888, which provided that all the rifle battalions should, in due course, be increased from 4 to 6 companies, according as might be

required by the exigencies of service and as money was available. In the meantime, the 12 battalions belonging to the 14th and 15th army corps districts, specially destined for operations in a mountainous country, were to be raised to the increased strength forthwith.

The actual increase in effectives over the existing establishments was as follows :—

- 1 to the battalion staff.
- 1 Lieutenant, to be in charge of the vehicles and mules.
- 1 sergeant } to look after these.
- 1 corporal }
- 1 corporal as shoeing-smith.
- 1 corporal as sick attendant.
- 3 privates as artificers and clerks.
- 7 to lead mules and driver.
- 2 draught horses.
- 8 mules (2 to each company).
- 1 Lieutenant or Sub-Lieutenant.
- 17 privates.
- 8 mules.

A law dated the 28th December, 1868, provided for the alteration in the artillery. The 12 new mountain batteries to be raised were to be attached, 6 to the divisional artillery regiment of the 14th artillery brigade, and 6 to that of the 15th brigade.

The strength of these batteries was fixed at the following :—

Establishment of a Mountain Battery.

- 1 Captain with 2 horses.
- 1 1st Lieutenant with 1 horse.
- 2 2nd Lieutenants or Sub-Lieutenants with 2 horses.
- 1 Adjutant with 1 horse.
- 1 maréchaux des logis chef with 1 horse.
- 1 fourier with 1 horse.
- 7 bombardiers.
- 1 bombardier as 1st shoeing-smith.
- 5 fire-workers.
- 4 carpenters and smiths.
- 2 assistant shoeing-smiths.
- 2 saddlers.
- 2 trumpeters.
- 122 gunners with 26 draught horses and 60 mules.

Total strength of the battery 160 Officers and men, with 34 horses and 60 mules.

Another law of the same date as that last referred to dealt with the subordination in time of war of the entire railway system to military authority.

The Minister of War makes the dispositions respecting all the lines lying within the country which are not situated within the sphere of operations. This control passes to the Commanders of the several armies in the case of those lines that lie within the sphere of operations. The Minister of War decides the time when this is to come into force in respect to each army and each line.

Amongst others the following are placed under the orders of the Generals commanding armies :—

1. Sections of railway workmen already organized and formed in time of peace by the railway companies and State lines.

2. Formation of railway troops.

The Administration of each line is to be represented at all times at the Ministry of War by an agent, who in peace time has, by the direction of the Minister, to make all the preparations for the transport of troops in war, and in war time to see that this is safely carried out. The Administration may further be called upon, even in peace, to attach an agent to the General who would in time of war command the army destined to operate in the district in which the line is situated. This official will have the same responsibility towards the General referred to as the agent previously mentioned has to the Minister.

A superior Military Railway Committee is to be formed already in time of peace.

On the motion of the War Minister, representatives of the Ministries of War, Marine, and Public Works, and of the large railway companies, are nominated by decree as members. Its sphere of action is to extend to the discussion of all matters concerning the employment of railways for war purposes.

In connection with the decree, regulations have been published regarding the following details (in the *Bulletin Officiel*, partie régl. No. 63) :—

1. Regarding the organization of the different branches which have to arrange for the transport ordered, and superintend its execution. At the head of each branch is an Officer and a technical agent of the railway company.

2. Regarding the organization of the railway workmen and their being called up in peace, the period of which is not to exceed 21 days.

3. Regarding the composition and sphere of action of the superior Military Railway Committee.

4. Regarding the organization and duty of the Etappen officials.

Recruiting.—The details of the number of recruits and their allotment to the several arms are to be found in the *Bulletin Officiel*, No. 43).

The total number of recruits, exclusive of non-effectives and those for the Navy, amounted to 152,228. The following were called up and assigned as noted :—

From the 1887 Class, 133,999, of whom 128,999 1st portion.			
			5,000 2nd portion.
1886 (put back)	12,973 1st portion.
1885	4,009 ..
			1,217 2nd portion.

Reserve.—Half of each of the yearly classes, 1879 and 1881, were called up for drill.

During the autumn manœuvres, between the 20th August and the 16th September, only the reservists belonging to the 3rd and 16th Army Corps were called out. Those of the other army corps were only drilled for 13 days, during the month of October, which was a departure from the practice in previous years. The infantry, zouaves, rifles, fortress artillery, and engineers (only those employed with the railway companies), as well as the non-commissioned officers of the infantry reserve detailed as drivers of the small-arm ammunition wagons in war, were up from the 1st to the 13th of October. The drivers referred to received their training with the Field Artillery. The rest of the Engineer reservists were up from the 3rd to the 15th October. Those of the Field Artillery were up in two series, each of 13 days' duration.

The untrained reservists of all arms indifferently were up for four weeks' training, from the 1st to the 28th October. The only exception was in the case of the cavalry reservists, of whom only those were called up who would be turned over to the Field Artillery in the event of mobilization. All those men who had not served actively before their transfer to the reserve were regarded as untrained. The calling up of the reservists took place by means of public proclamation.

In the course of the year the reservists of the Train and of the Administrative services were called up for different periods, each of four weeks, by means of notices personally addressed.

During the period between the 1st July and the 31st December the several yearly classes still under obligation to serve were distributed in the following manner:—

With the active army.....	the classes from 1887 to 1883
" reserve to the active army	" " 1882 to 1879
" territorial army	" " 1878 to 1874
" reserve to the territorial army....	" " 1873 to 1868

Remounts.—For 1889 the number of horses was fixed at 111,661 (exclusive of those belonging to the gendarmerie).

Of these, 13,543 were Officers' horses; 784 for the schools, and 97,333 troop horses; being 4,838 more than in 1888.

14,148 remounts were to be bought; the prices were fixed at the following rates:—

	Officers' horses. francs.	Troop horses. francs.
Horses for cuirassier regiments	1,400	1,160
" dragoon regiments, the general staff, artillery and train	1,260	1,036
" light cavalry.....	1,140	910
" infantry.....	1,000	—

The total sum taken in the Estimates for 1889 on account of remounts was 14,370,520 francs, being an increase of 1½ million francs over that for 1888.

The Remount dépôts at Angers, Mérignac, Arles, and Favernay were converted into dépôts de transition, and attached to the Remount dépôts at Fontenay, Agen, Macon, and Villers. The buying committees previously existing at the first-named dépôts were done away with.

War Matériel.—The provision of a large number of new field, fortress, coast, and siege guns is contemplated for 1889; about 160 millions were taken in the Estimates for extraordinary expenditure.

The following leading principles for guidance in the construction and armament of fortifications are stated to have been laid down by the superior Council of War:—

1. The detached forts and small independent works are to be provided with all the means made available by the present state of technical science for offering the most obstinate resistance; for with them the fortified works themselves, and not their garrison, will form the main point of the defence.

2. Less money is to be spent over the larger works than hitherto; for their chief strength lies in the action of large garrisons, in the extensive development of the fronts of fire, and in the skilful utilization of the ground.

3. To abandon a number of the smaller fortresses.

The Engineer Committee have further determined upon the type of

armoured towers, and how these can be adapted to the fortresses and detached forts.

In the course of the year continuous alterations were made in the fortresses and forts, and were directed chiefly to the restoration of the covering of the bomb-proof shelters, and to placing new armour, in view of the increased powers for destruction of siege artillery.

Layers of "beton" were used for the bomb-proof covering (*L'Avenir militaire*, No. 1286, 1314, 1316, 1320). A short description of the French fortresses, with four maps, is to be found in the *Guide-poche de nos forts et places fortes*, Paris, 1888. Lévy et Cie.

A further completion of the frontier fortifications is contemplated by the construction of new works and the strengthening of existing ones. For this purpose the following sums are provided in the budget for 1889 :—

	francs.
For the fortifications of the eastern frontier	62,533,000
" " " south-eastern frontier	168,000,000
" " " northern frontier.....	5,000,000

A further sum of 25 millions was asked for by the Minister of War for the construction of forts, intermediate works, and railways at Paris. The Budget Committee did not report in favour of this expenditure, on the grounds that the sum was too small for the purposes for which it was required, and added their opinion that there was no pressing necessity at the moment for the construction of new works. The Minister of War stated that he would be under the necessity of renewing the demand later on.

Means of Communication.—The entire railway system, which at the end of 1878 comprised 23,401 kilometres, amounted at the end of 1887 to 31,210 kilometres, showing an increase of 11,000 kilometres in the 9 years, an increase in excess of that constructed by any other state. Strategic considerations have regulated principally the construction of the new lines. Regulations have been published for the instruction of the railway regiment, the formation of which was planned in 1888, but not carried out. The instruction is divided into two parts, the one dealing with the military, the other with the technical instruction. The former is to be conducted under the regulations for infantry as far as company drill; battalion formation is only to be adopted on parade. The technical instruction is to be carried out by the railway-schools attached to the regiment, and by means of practical exercises. The Colonel of the regiment superintends, and is the head of the school; a battalion commander of the engineers acts as director, and the necessary teaching staff and civil instructors are attached. The curriculum comprises the French language, mathematics, physical sciences, geography, history, engineering duties, and the construction and working of railways.

The practical exercises take place in the first instances by companies, later by battalions, and then by the entire regiment. They extend over all the duties required to be performed by railway troops in war. A number of Officers and men are trained in the duties of working the line, of the workshops, and of telegraphy, as well as in driving locomotives. On the Government line, between Orléans and Chartres, two small detachments of railway troops have been employed since the spring. Each detachment consists of 1 Captain, 2 Lieutenants, 11 non-commissioned officers, and 48 corporals and privates. One detachment provides, in combination with the civilian officials, for the work at six stations and on the trains; the other is only there for the purpose of being instructed. The Lieutenants act as station-masters: the non-commissioned officers as assistants and telegraphists; the corporals as engine drivers, and the privates as guards, stokers, pointsmen, &c.

Military Telegraphs. By a decree of the 10th November, 1888, amending that of the 23rd July, 1834, regarding the organization of military telegraphy, the whole of the personnel of this service is to be employed in time of war with the army in the Directions, the sections of the 1st and 2nd lines, the telegraph park, and in the territorial service. The Minister of War decides on the places at which the several formations are to be mobilized, and the day when the mobilization must be completed. From the commencement of this, the officials and agents of military telegraphy form an integral portion of the army, and are subject to its laws and regulations. They enjoy according to their rank all the rights, honours and distinctions accorded to persons in the territorial army. A General, to be nominated by the Minister of War, is charged with the inspection annually of all branches of the military telegraph service.

The departments of War and Finance make the necessary arrangements for furnishing and keeping up the matériel.

The chief of the staff and the telegraph official attached to the general command for this purpose, in each region, are to make the necessary arrangements in time of peace for the rapid mobilization of the directions, parks, and sections, as well as for the organization of the territorial service.

Army Estimates.—The ordinary estimates for 1889 were fixed at 550,652,402 francs, being an increase of nearly 14 millions on the previous year.

As regards the extraordinary expenditure, the original scheme, which involved the spending of over 2½ milliards of francs in replacing war matériel was completed at the end of 1887. But it did not follow that the extra expenditure was at an end; on the contrary, the demands made in 1888 for purposes of national defence amounted to another milliard. The greater portion of this, viz., 770,731,000 francs, were voted in December last by an overwhelming majority of the Chamber. Of this sum 228,335,000 francs have already been spent, 138,554,360 francs are allotted for 1889, and the rest is to be spread over the five following years.

The total establishments of the army for 1889 were fixed at 541,365 Officers and men. But as in this number 42,314 men are included and borne as temporary absent, the average effective strength would amount to 499,051 Officers and men.

Taking the higher number, the troops proper, including the departmental services, amount to 501,826 Officers and men, distributed as follows:—

	Officers.	Men, all ranks.
Infantry	10,899	204,521
Cavalry	3,273	71,270
Artillery	2,518	70,586
Engineers	388	10,591
Train	396	11,400
Administrative branches	—	16,043

As compared with the establishments in 1888, those for 1889 show an increase of 16,369 men and 4,838 horses, and a decrease of 579 Officers (530 infantry and 49 gendarmerie) and 136 gendarmes.

Ministry of War.—By a decree dated the 12th May, 1888, the Superior Council of War was reorganized for the fifth time since its establishment in 1872. At the same time the Committee of Defence was dissolved, on the grounds that as the new fortifications had been executed, it was no longer required. As formerly organized, the Council of War was only assembled at the pleasure of the War Minister, and often for a year at a time it was never

called together. In future the War Minister must assemble it at least once a month to discuss questions connected with defence, mobilization, the construction of strategic lines of railway, the general organization of the army, and the armament and defence of the coasts. The Council consists of 12 members, of whom four belong to it by reason of the positions they fill, and eight are appointed by presidential decree. The former are the Minister of War, who acts also as president, the Chief of the General Staff, to whom the duties of reporter are entrusted, and the presidents of the Artillery and Engineer Committees. The President of the Republic is empowered to call the Council together and take the Chair, in which case the Minister president and the Minister of Marine attend. The sub-chief of the General Staff charged with the work concerning military operations acts as Secretary. Besides these, the Directors of Sections at the War Department attend when the subjects to be discussed are connected with the branches for which they are responsible. In the event of questions as to the construction or abandonment of fortified places, or coast defences, having to be decided, the General Commanding the region affected, the Inspectors General of Artillery and Engineers or in the case of coast works, the Chief of the Staff to the Minister of Marine, the Inspector-General of the Marine Artillery, and the sea prefect of the arrondissement concerned.

The members appointed by decree were the Governor of Paris and seven divisional Generals. Of these latter it is believed four would in the event of war be appointed to the command of armies. To avoid these commands being assumed by Officers unacquainted with the state of the several army corps that would come under their orders, a decree of May, 1888, provides for their being informed by letters of service which army corps would form their respective armies. And though they cannot exercise command over these until their actual formation on mobilization, they are held responsible for the performance of very important duties in connection with them during peace. These are to look into everything connected with mobilization, war matériel, the distribution of the troops, the position of fortifications, and the means of transport, so far as they are connected with the sphere occupied by the several corps destined to compose the respective armies. These Generals are also to be employed in time of peace with special missions by order of the Minister of War, and to preside at conferences at which the corps commanders are assembled for the discussion of questions affecting several army corps. Special instructions issued by the Minister of War regulate in each individual case the relations between the corps commanders and the members of the Superior Council; the latter are to avoid any interference in internal arrangements, and they are to assume the control of the manœuvres of army corps operating in concert.

A new organization was also given to the consultative Committees. Their functions are to be limited to subjects of a purely technical nature, and not to be extended to those concerning administration, personnel, law, and strategy. The consultative Committees of the General Staff, of the several arms, of the sanitary service, and of the Intendance are to be termed Technical Committees, and are to limit their discussions to the questions referred to them by the Minister of War, concerning organization and training, and the changes to be made in these. The number of members of such a Committee is to be nine, of which seven must belong to the arm or branch of the service concerned. The Minister of War nominates the presidents, for the period of one year, and the members, who must belong to the troops stationed within the area of the Military Government of Paris or the neighbouring regions.

Re-armament of the Infantry.—During 1888 nearly the whole of the infantry was provided with the new repeating rifle on the Lebel system. In November

as many as 2,200 of these rifles were turned out daily, of which 1,200 by the St. Etienne small-arm factory, 600 by that at Chatellerault, and 400 at Lille. The whole of the infantry belonging to the territorial army are to be furnished with it also during the present year.

Train des Equipages.—In the Manual for General Staff Officers it is laid down that on mobilization each squadron of the train forms three new companies, which take the numbers 2, 4, and 6. The six companies are then formed into nineteen detachments. The 1st and 3rd companies, attached to the two infantry divisions, furnish three detachments, each for the horsing of the field post and treasury wagons, the ambulance wagons, and provision columns of the division. The 2nd company also furnishes three detachments for the ambulance wagons, and the first half of the corps provision column, and provides the personnel for the mobile remount dépôt.

The 4th company furnishes, in five detachments, the horses, &c., for the ambulance of the cavalry brigade, for the field post and treasury wagons of the army corps, the second half of the provision column of the army corps, the clothing column, and the telegraph section of the first line.

The 5th company forms four detachments: three for the ambulances and drivers for the mules; the fourth for the six field hospitals.

The 6th company only provides for the field bakery column; the remainder stays with the immobile army corps. The strength of the Train squadron of a mobile army corps has for its cadre 21 Officers, 80 non-commissioned officers, 92 corporals, 16 trumpeters.

Officing the Territorial Army.—During the year 1888 the number of Officers was materially increased, especially in the infantry. Over 900 new appointments were made in the rank of captain, partly by appointing retired captains, partly by the promotion of lieutenants; 700 sub-lieutenants were also appointed from those who had been one-year volunteers and non-commissioned officers. A number of superior Officers who had served in the Marines were also transferred to the Territorial Army. The increase was necessitated by the contemplated addition of a fourth battalion to territorial regiments. It is further contemplated to form fifth and sixth battalions in the event of war, to be called supplementary battalions.

Following the instructions of the 1st January, 1879, the Ersatz districts for the individual battalions of the infantry territorial regiments were assigned to the arrondissements and cantons within the sub-divisions (8) into which each region is divided (the 15th has 9). This arrangement has now been abandoned, and it has been ordered that the whole of the battalions of a regiment shall be recruited from the entire sub-division district, the troops belonging to the other arms throughout the region. No change has taken place in the points for mobilization.

It has been stated by the press that, in the event of mobilization only, the youngest class with the territorial army, viz., those 30 years of age, would be taken for the active army; that the 1st and 2nd battalions of territorial infantry regiments would be sent into the field, and be composed exclusively of men of from 31 to 34 years of age, and that the remaining battalions would be formed from the reserve of the territorial army.

One half of the whole number of the two classes 1876 and 1877 of the territorial army were called out for training during a period of thirteen days. The infantry were armed with the new magazine rifle, and two battalions took part in the national celebration of the 14th July.

Greece.

The strength of the Greek Army, as fixed for the estimates for 1888, was 26,340 men. It is divided between three General commands, the headquarters of which are stationed at Athens, Missolonghi, and Larissa.

The infantry consists of 10 line regiments of 3 battalions of 4 companies, 139 strong, and of 8 rifle battalions of 4 companies, 132 strong; but of these latter 6 of the battalions only are kept complete, the remaining 2 being only cadres.

Of cavalry there are 3 regiments of 4 squadrons, each 129 strong, with 101 horses. The artillery is composed of 3 regiments, of which the 1st and 2nd have each 4 mountain batteries; the 3rd 3 mountain batteries, 2 field and 1 mortar battery. Total 14 batteries each of 6 guns; the mountain batteries have a strength of 122, the field batteries of 132.

There is one regiment of Engineers of 2 battalions of 4 and 5 companies respectively, the 5th being a railway company; the strength of each company is 119.

There is one company only of Train, and a double company of the Sanitary service.

Universal service was introduced in 1887, the obligation lasting from the completion of the 21st to that of the 51st year.

This period is distributed as follows:—

In the Standing Army	2 years.
„ Reserve to the Army	8 „
„ Landwehr	8 „
(in the cavalry 10 years)	
„ Reserve to the Landwehr.....	10 „
(in the cavalry 8 years)	

The number of recruits to be enrolled each year is fixed by the War Ministry, and the required number chosen by lot. The remainder of the year's contingent go to the Ersatz Reserve, paying a fixed sum to free them from having to come up again the following year to take their chance for the active army.

The reserve to the army are to be called up for forty days' training during the 4th and 8th year of their service. The Ersatz reserve receive three months' training, and are during the rest of their term liable to be called up by the War Minister to supply the waste of the active army.

The law prescribes no drill for the Landwehr or its reserve. It lays down only that the former is to be called up in the event of war, the latter in case of invasion.

Italy.

The period of service in the active army is now uniformly fixed at three years, with the exception only of men in the cavalry, who serve four years. The year's contingent was fixed at 82,000 men for the army; but only 77,120 actually joined the colours. These were distributed 46,577 to the infantry, 6,438 to the cavalry, 12,879 to the artillery, 2,852 to the engineers.

The enrolment of volunteers was provided for as follows:—

One-Year Volunteers.—1. Each regiment to enrol 4 per company, squadron, or battery, to be counted in the establishment of the regiment.

2. Every military hospital Direction 4, of whom 1 to be an apothecary.

3. Every district having the headquarters of a General command 2 as Ersatz Officers for the commissariat or pay corps.

Ordinary Volunteers (for 1889).—Every regiment of infantry, bersaglieri, artillery, and cavalry 10; each engineer regiment 10; Alpine troops no limit.

Remounts.—On the 1st July, 1888, there were 8,014 horses on the remount depôts. Of this number 4,200 were bought last year in Italy as foals. During the year 3,000 horses had been supplied by the depôts. They now provide the whole of the cavalry, one-third of the artillery, and the Officers of all ranks

who are entitled to them. Owing to the division or doubling of the regiments of field artillery, a great number of horses have had to be purchased.

A new law for the requisition of horses provided that in case of war all quadrupeds (thus including mules) suited to military purposes may be taken at their estimated value. Those not actually taken remain at the disposition of the State. In each parish a list is drawn up of all the owners of horses or mules, and on the basis of these Committees are to be appointed annually to inspect and value the animals, and they are lettered according to the order in which they would be called up on mobilization. By a report made to the Chamber it appears that the first requirement, amounting to 120,000 horses, could be easily obtained, and the entire number required could be got in Italy alone.

Magazine Rifle.—The converted Vetterli rifle is still the arm in use; and provision has been made for the further conversion of 350,000 rifles from the original pattern into magazine arms during 1889. Trials with an arm of reduced bore have been carried on notwithstanding.

The number of rounds carried by troops armed with the magazine rifle are as follows:—

6 packets of 8 cartridges in the havresack.....	48 rounds.
3 " 8 " " pouch	24 "
6 magazines of 4 cartridges in the pocket	24 "
Total	96 "

Troops armed with the single loader carry 8 rounds less.

Strength of Armed Forces.—On the 1st June, 1888, the following was the strength:—

Permanent Army—

Officers in active service, on half-pay, &c.	14,309
Ersatz Officers	4,110
Non-commissioned officers with the colours	16,215
on unlimited furlough.....	6,463
Corporals with the colours	42,774
on unlimited furlough	70,314
Privates with the colours	177,714
on unlimited furlough, 1st category	290,756
" " " 2nd " (trained).....	175,881
" " " 3rd " (untrained)...	616,479
Total Permanent Army	1,405,053

Officers' horses	8,680
Troop horses	35,846

Total..... 44,526

Mobile Militia—

Officers	533
Ersatz Officers	2,741
Non-commissioned officers	6,521
Corporals	30,519
Privates, 1st category	163,431
" 2nd " (trained).....	62,465
" 3rd " (untrained).....	122,636
Total Mobile Militia	388,846

Territorial Militia—

Officers	5,512
Non-commissioned officers.....	11,677
Corporals	54,072
Trained privates	575,496
Untrained privates.....	605,992

Total Territorial Militia 1,342,739

Grand Total 3,136,638

(Of whom 1,435,097 untrained).

It is to be noted that all are returned as "trained" who have been called up for even short periods of drill.

Training of Reserves.

The infantry and bersaglieri of the 1st category of the yearly class 1860, were called up for 10 days, the Alpine troops for 23 days, 21,400 men. These took part in the manœuvres.

The 1st Category Class, 1862, of all arms, except cavalry, for 28 days. The Alpine troops with those of the 1860 class. The total number of these was 37,100, and they also took part in the manœuvres.

The 2nd Category Class, 1867, 17,400, men for 45 days; for such of them as had gone through a year's course with the National Rifle Association the period of instruction was reduced to 20 days. Including men of the mobile and territorial militias, the total number called up during 1888 for instruction was 131,000, showing an increase of a quarter over the number in 1887. For 1889 it will be still greater, in order that all the men not with the colours may be instructed with as little delay as possible in the use of the magazine rifle.

Reorganization of the Artillery.—The changes prescribed by the law of 1887, detailed in the Reports for that year, have been gradually carried out. The general inspection, inspections, and artillery commands contemplated by it were called into existence by a decree of the 7th June, 1888, which defined the scope of their respective jurisdictions and duties.

The Inspector-General is placed directly under the Minister of War; he superintends the technical service of the artillery, controls the studies and experiments relating to the artillery service, the matériel, the employment of the arm in war, and the armament of fortresses. He makes proposals of a general nature, i.e., such as it is beyond his own sphere to decide. Under the orders of the Minister of War he inspects in all branches of his service.

The Inspectors have similar duties to perform within their several jurisdictions. Of the two Inspectors of field artillery one deals with the field artillery in the district occupied by the 1st to the 5th army corps, the horse artillery, and the mountain artillery regiments; the other deals with the field artillery of the 6th to the 12th army corps. They communicate with the Minister of War through the Inspector-General.

The Officers at the heads of the several artillery commands have the same authority and duties as the former artillery territorial commanders; that is, as a brigade commander in everything relating to discipline, duties, and training of artillery. Personally they are, together with their Officers, subordinated to the General commanding the district in which they are situated. For the rest they are directly responsible to the Minister of War, and communicate with him on all points concerning 1st, the technical and administrative part of the duties of the Territorial Directions and Artillery Establish-

ments; 2nd, the civilian official personnel with the regiments, Directions, and Establishments. The four field artillery commands are established in Milan, Piacenza, Bologna, and Rome, the two fortress artillery commands in Turin and Rome.

The doubling of the field artillery regiments was prepared for in 1887 by the creation of four new batteries per regiment, which then had 14 batteries each. On the 1st October, 1888, the light (7-cm.) batteries which had previously in peace 6 guns each were reduced to 4 guns. On the 31st October two new heavy (9-cm.) batteries were formed per regiment, and from the following day the separation of each of the regiments, now 16 batteries strong, into two regiments, took effect. Of the 24 regiments thus formed 12 are divisional artillery, and are armed exclusively with heavy guns. 12 are corps artillery, and have in each of their two brigades of 4 batteries two armed with light, and two with heavy guns. Whereas the peace strength hitherto of batteries having 4 guns, was 100 men, and 54 horses, the new batteries have only 90 men, and in the case of heavy batteries 45 horses, of light 42. On mobilization the batteries are all to be made up to 6 guns, in place of 8 as previously. The divisional artillery regiments have each one train company, the corps artillery regiments two companies. In war, besides the artillery brigade and regimental commanders, there is to be a commanding Officer of artillery with every infantry and cavalry division.

Creation of Engineer Inspections.—On the 1st July, 1888, a General Inspection and Inspections were created for the Engineers. On the same date the Artillery and Engineer Committee was dissolved.

The Inspector-General is directly under the Minister of War; he superintends the technical duties of the Engineers, and controls the studies, duties, and buildings connected with the Engineer service. He makes proposals regarding questions of a general nature, and he inspects all branches of the service under the orders of the Minister of War.

The Inspectors perform similar duties within their own spheres.

Mobile Militia Training.—The 1st Category of the infantry and bersaglieri of the Classes 1856, '57, and '58, belonging to 15 districts, amounting to 17,000 men, were called up for 10 days' drill. The Officers were up for 12 days. The men were formed into 21 battalions and 20 bersaglieri companies; the battalions were commanded by Officers of the line, the companies by Captains and Lieutenants, for the most part drawn from the active army. The result of the training was regarded as satisfactory; but the Officers belonging to the Mobile Militia, for the most part taken from one-year volunteers, left much to be desired as regards their efficiency.

Organization.—The new organization prescribed in 1877 was detailed in the Reports for that year. The following modifications have been made in giving effect to it:—

- There are now 48 infantry regiments (in place of 44).
- 12 brigades of field artillery (in place of 13).
- 13 train companies (in place of 14).
- 34 fortress artillery companies (in place of 36).

The several units of the Mobile Militia have the same strength and composition as those corresponding to them in the permanent army, except that they do not have bands. In the reorganization an approach has been made to the territorial system by allocating the regiments to districts.

Territorial Militia Training.—The 1st and 2nd Categories of the infantry, Classes 1852, '53, '54, and '55, and the 3rd Category, Classes 1861 to 1866, of 23 parishes, in all about 15,000 men, were called up. They were formed in 31 battalions at the large garrisons, and drilled for 10 days, exclusively by

Officers of the Territorial Militia, with one exception. The period was pronounced too short for any solid results to be obtained, and the same insufficiency was observable in the efficiency of the Officers as was the case with the Mobile Militia. The 1st and 2nd Categories of the Artillery, Classes 1852, '53, and '54, of 21 districts, numbering about 3,000 men, were up for 15 days. The 3rd Category, Class 1867, about 18,000, for the same period. The Territorial Militia forms now an integral part of the army, and it is to be armed with the converted Vetterli rifle. The period of drill is fixed at 30 days every four years—which may be spread over these years.

Sanitary Service.—The "Red Cross" Society in Italy is organized under the Minister of War for services with the army, and can provide the following assistance :—

	Beds.
13 hospital trains with beds for 200 sick or wounded	2,600
4 hospitals with 200 beds	800
12 " 50 "	600
Total	4,000

To facilitate the work of the Society, the Minister of War has sanctioned the exemption from other service in peace and on mobilization of men belonging to the Territorial Militia, excepting those of the artillery, engineers, sanitary and supply services, who are enrolled as members of the Society.

Montenegro.

Since 1883 the Montenegrin forces have been composed of a standing army and the war levy. The dimensions of the former are very limited ; it consists of the guard 300 strong, a portion of which is mounted, and three garrison battalions 490 each ; total, 1,770 men. The war levy consists of 45 battalions, for which arms are available ; and 300 artillerymen trained by Russians, with 24 Krupp guns (7·5-cm.). The total strength is estimated variously at from 24,000 to 35,000 men capable of bearing and trained to arms from earliest youth.

Austria-Hungary.

The Army law of 1868 fixed the strength of the army, in the event of war, for a period of ten years. It was renewed for a like period with certain modifications in 1878, and consequently came on again last year for a further renewal. The occasion was taken advantage of to introduce material alterations, which were met with considerable opposition in the Chambers at Vienna and Pesth, as well as in the country generally. The original basis on which the number of the annual contingent of recruits was that they should be sufficient to secure to the State an armed force of 800,000 men (including navy) in first line ; this number was 95,474. The object aimed at has been so far satisfied by this arrangement that on paper the 800,000 have been fully maintained. But it has been alleged, very truly, that a paper strength is not the effective strength, and that to deduce this from it, 8 per cent. must be deducted, in this case 64,000. To obtain, therefore, an effective strength of 800,000, the paper strength must certainly not be less than 864,000, to maintain which necessitates the yearly contingent being increased to 103,100 ; and this is provided for by the new law.

A further increase is made in the case of the Ersatz Reserve, which in the army as well as in both Landwehrs is fixed at 20 per cent. of the annual contingent. In accordance with this the number of recruits to be annually enrolled for the several branches of the armed forces is as follows :—

	Men.
For the Army	103,100
„ Ersatz reserve to the Army	20,620
„ Austrian Landwehr	12,000
„ Ersatz reserve to Landwehr.....	2,400
„ Hungarian Landwehr	12,500
„ Ersatz reserve to the Hungarian Landwehr	2,500
Total.....	153,120

These numbers are calculated to provide not only for a field army of 1,200,000 men, but further for maintaining it, during a war of long duration, at that strength by means of the Ersatz reservists.

A material point in the new law is the alteration in the age at which those drawn to serve in the active army come up, from 20 to 21 years of age. The necessity for this was stated to be the defective growth and stamina of the recruits called up from some portions of the Austrian dominions. The obligations to service now, therefore, begins with the 1st January in that year in which the 21st year of age is completed. The term of service is 3 years with the colours, and 7 years in the reserve to the active army, 10 years in the Ersatz Reserve, 2 years in the Landwehr and its Ersatz Reserve, and lastly in the Landsturm up to the completion of the 42nd year. Those who are enrolled direct in the Landwehr without previously having served in the regular army or Ersatz Reserve belong to it and its reserve for 12 years. The obligation to serve in the Landsturm in the case of Officers unemployed or who have left the army, lasts until the age of 60.

An important addition has been made to the regulations regarding one-year volunteers. It is upon this class that the reserves are in great part dependent for Officers in the lower ranks. On the conclusion of the twelve months' service every one-year volunteer has to present himself for examination, with a view to qualifying for appointment as an Officer of reserve. But it was found that these young men placed no particular value upon qualifying for the position, and a large proportion failed to do so. In order to put a stop to this unsatisfactory state of things, a new regulation has been adopted by which those one-year volunteers who fail to pass the examination at the end of their term of service will render themselves liable to serve for a second year.

War Matériel.—By the end of February, 1889, the small-arm factory at Steyrer had turned out 230,000 of the new small-bore (8 m.m.) magazine rifle, and gave a daily output of 860. As many as fourteen infantry divisions had been armed with the new pattern and furnished with the new ammunition for it, and also for the most part with the new pattern two-wheeled company ammunition carts. The infantry regiments and rifle battalions which had been armed with the new rifle had the whole of their reservists up for a special 7 days' drill, for the purpose of exercising them in the use of the magazine arm. With a view to improving the shooting of the army, so as to ensure the best possible result from the use of the magazine rifle in war, the allowance of ammunition for target practice was raised in the infantry from 110 to 150 rounds per man, which is the number previously allowed in rifle regiments.

The introduction of a fuze that will burn for an increased length of time has the double advantage, that the field artillery will have an increased range for shrapnel fire, and be able to employ indirect fire to a greater extent.

In the entrenched camp of Przemyśl several provisional works were strengthened, some converted into permanent ones and armed anew. In the fortress of Cracow a large artillery arsenal was commenced, and in the

Southern Tyrol the reconstruction of existing and the creation of new works, commenced the preceding year, were continued. The land defences of Pola, commenced in 1887, will be completed in 1889.

Communications.—In the course of 1888 several branches, the construction of which was recommended by the railway section of the General Staff, in connection with the important strategic line Kaschau-Oderberger, were undertaken. The single lines on the Czerencs-Legenye Mihály line of the Hungarian North-Eastern Railway, and on the Legenya Mihály-Mező Laborecz line of the Hungarian-Gallician line, were doubled. This was also done on the Hatvan-Miskolcz-Czerencs line of the Hungarian State Railway. In Hungary also a new main line was laid from Sunja to New-Gradiska 77·8 kilometres in length, and a line, Vlarapaso-Tepla-Trencsin-Teplitz (46·5), besides several minor and local lines.

Modifications in Organization.—The peace establishments for 1889 was fixed at 18,960 Officers, 276,400 other ranks, and 51,460 horses.

With the object of ensuring a more rapid and effective mobilization, several modifications, some of considerable importance, have been introduced into the previously existing organization, these are to the following effect:—

1st. The creation during peace of certain formations previously postponed until the period of mobilization. Such were the creation of five heavy battery divisions on a reduced peace establishment and of three train squadrons for five and three Landwehr divisions respectively; the formation of the staffs for the three most important cavalry division commands; and the establishment of a telegraph Ersatz cadre to the railway and telegraph regiment.

2nd. The strengthening of the existing formations, which were considered too weak for the requirements of a mobilization. Thus the number of senior Officers was increased with the infantry, rifles, railway, train, and sanitary troops, so as to have an Officer available to command the new formations to be called into existence on mobilization. An increase in the strength of eight railway companies.

A further increase to the army has been effected by making supernumerary 640 Officers and 1,500 non-commissioned Officers and soldiers detached to schools and offices from the troops. The total increase for the year amounts to 1,341 Officers, 3,136 men, and 407 men, without including 2,050 men and the same number of horses of the cavalry kept supernumerary to the ordinary establishments, with a view to meeting the increased requirements of the cavalry on mobilization through the formation of staff detachments.

Siege Batteries.—At the close of the manœuvres in 1888, a provisional organization was introduced by the formation of a group of mobile siege batteries to be a mean between field and fortress artillery. The guns of the field artillery are often too light to carry out effectively the attack against hasty field entrenchments. The heavy guns of the siege train are not easily made available against hastily constructed works, and they are not required for the purpose. Guns of position of 12 cm. calibre and 15 cm. mortars are amply sufficient, and are more easily moved. So as to have them available with the various columns operating at a distance from the siege park of an operating army, they are to be organized in groups and rendered mobile. A trial with this object was made at the Vienna arsenal by the formation of one battery of guns and two of mortars into a "Group of siege batteries." The gun battery was composed of four 12-cm. short steel-bronze guns, the mortar batteries each of four 15-cm. steel-bronze siege mortars. The group, therefore, comprised 12 guns, with 82 wagons, 534 men, and 400 horses. The experiments carried out gave very satisfactory results, and it was decided to make these groups a permanent formation for the artillery. Five groups are to be formed: two in Vienna, and one each for Budapest, Cracow, and Przemyśl. They will be separated entirely from the siege park, and attached

to the operating armies, where they will be placed directly under the army, army corps, or divisional-commander.

Russia.

The law regarding universal service of 1874 received an important alteration by a decree of the 26th June, 1888, which was stated by the Russian press to be intended to meet the new provisions of the German Army law.

Obligation to service begins with the 21st year of age. The recruits are selected in the autumn of the year in which they complete their 20th year. The duration of service in the standing army is 18 years, of which 5 years with the colours and 13 in the reserve. The period with the colours is shortened in the case of the educated classes according to a scale which varies with the standard of education, and is different according as the individuals have been raised, in the ordinary manner, by lot, or are volunteers. This is shown by the following table:—

		With the colours.	In the reserve.
<i>Men Raised by Lot.</i>			
1st standard of education	} Leaving certificates from the several educational estab- lishments	2	16
2nd " "		3	15
3rd " "		4	14
<i>Volunteers.</i>			
1st standard of education	{ Certificates from educational establishments of the 1st and 2nd classes	1	12
2nd " "		2	12
	.. Special examination.....		

In the case of the populations beyond the Caucasus and of the foreign populations of the Kuban and Terek territories, the service is 3 years with the colours and 15 in the reserve.

The reservists are obliged to attend two trainings, each of six weeks duration.

The Reichswehr consists of the entire population capable of bearing arms who do not belong to the standing army, from their 21st year till they complete 43 years. They are divided into two levies. The first levy serves to complete and strengthen the standing army as well as to form Reichswehr formations, and includes men belonging to the following categories until the completion of their 43rd year:—

1st. Those who have completed their army service.

2nd. Those who are liable but are not taken for the regular army, provided they are fit for active service and are not the only support of their families. The four youngest yearly classes are under military control, and can be called up for two trainings of six weeks' duration.

The second levy serves exclusively to form the units of the Reichswehr troops, and is composed of those individuals who have been exempted from

service in peace time on account of their being the only support of their families, and of those who have not been found fitted for active service.

Certain classes of professional men are given great concessions in regard to the obligation to serve. Those in holy orders belonging to any Christian persuasion, and the trained psalm-readers of the orthodox faith at the clerical academies, &c., are entirely exempted. Doctors, veterinary surgeons, apothecaries, teachers, artists trained abroad at the expense of the state, can only claim exemption during peace.

Claims on account of family, property, and civil education are taken into consideration, exemption during peace being granted or temporary postponement of service, according to the circumstances.

The changes made in the new law, particularly those which have for their effect to shorten the service with the colours and to lengthen that with both the reserve and the Reichswehr, should be of great advantage from the military point of view. If, as is alleged, the machinery for thoroughly training the men in the shorter period (virtually four instead of five years for the majority) is in existence, the gain is evident, and will also be a great boon to the people. By prolonging the length of service in the reserve by three years, the number of trained men available for the field armies will be increased by about 637,500 men. Of more importance than the prolongation of the obligation to serve in the Reichswehr from the age of 40 to that of 43, is the provision that the four youngest yearly classes belonging to it shall be subject to military control. Though not in name, this virtually provides a valuable Ersatz reserve, previously wanting in the Russian organization.

Establishment of Pigeon Posts.—As an experiment, military pigeon posts are to be tried for a period of three years, under the control of the Engineer Department. Their object is to maintain communication with the fortresses in the event of investment. The post-stations are divided into four classes, according to the number of directions in which communication has to be maintained; 250 pigeons is the number allotted to each line. The 1st class stations are under a Lieutenant-Colonel, the rest under other Officers. Those situated in fortresses are subordinate to the commandants, others to the chiefs of the military district staffs. A special breeding depôt is to be established at Brest-Litovsk. The stations at which the experiment is to be made are stated to be the following:—

Brest-Litovsk, 1st class

Line to Novogeorgievsk.....	200 versts	} 1,000 pigeons.
" Warsaw.....	170 "	
" Ivangorod.....	130 "	
" Luninez (near Pinsk) 200	"	

Warsaw, 2nd class—

Line to Novogeorgievsk	25 versts	} 750 pigeons.
" Brest-Litovsk	170 "	
" Ivangorod	85 "	

Novogeorgievsk, 3rd class—

Line to Brest-Litovsk.....	200 versts	} 500 pigeons.
" Warsaw.....	25 "	

Ivangorod, 3rd class—

Line to Brest-Litovsk	130 versts	} 500 pigeons.
" Warsaw.....	85 "	

Luninez, 4th class—

Line to Brest Litovsk.....	200 versts—250 pigeons.
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Communications.—The lines opened for traffic in 1888 were the following :—

Trans-Caspian as far as Samarcand.
 Romny—Krementschug.
 Samara—Ufa.
 Rshel—Vjasma.
 Jassinowataja—Kalmius (Donez-Becken).
 Samara—Volga bank.

The following lines are in course of construction :—

Kasatin—Uman—Schpola.
 Wapnjarka to a station on the line Kasatin—Uman.
 Riga—Valk—Pskoa.
 Valk—Dorpat.
 Ufa—Slatoust.

A new arrangement has been approved of for goods wagons to facilitate their employment for the transport of troops. It allows of their being disposed in two tiers, and has the advantage of giving room for them to lie down at night.

Infantry-Reserve-Battalion Cadres.—These cadre formations have received an increase in the number of their officers, and three battalions have been expanded into regiments of two battalions each. This in itself is of no great importance; but if, as has been rumoured, this expansion were to be extended to the reserve battalions generally, it would mean an increase to the army of 116 battalions.

Increase of Rifle Battalions.—The twenty single rifle battalions that existed previously have been converted into twenty rifle regiments of two battalions each. It is stated that a further development is contemplated, by which a 3rd and 4th battalion would be added, and that eventually separate brigades will be formed from these troops.

Train.—At last a special formation of train troops has been adopted by Russia. Five train cadre battalions have been formed, of which No. 3 has two companies and the rest four. The companies are divided into 5 subdivisions, and are numbered throughout from 1 to 18. Each subdivision serves as the basis of a war transport. The establishment of a battalion of four companies in peace is 15 Officers, &c., 399 men, 40 two-wheeled carts with 80 horses. Each battalion has on charge the necessary vehicles, harness, and equipment for the expanded formations in war.

On mobilization each company is expanded to form a war battalion (Nos. 1 to 18), each furnishing 5 war transports (90). The commanders in peace of the battalions become heads of the army transport, the company commanders are appointed to command the war battalions. Each wagon transport is divided into two subdivisions of four sections, with a total of 183 two-wheeled carts. The amount of provisions to be ordinarily carried by each of these wagon transports consists of a four days' supply of biscuit and groats, and an eight to ten days' supply of salt, or tea and sugar for 10,000 men, as well as a three days' supply of oats for 1,600 horses. The requirements of the transport column itself is also provided for.

Supply of Ammunition.—Flying artillery parks are attached to the divisions of the mobilized army in the following proportion : 4 (two with S.A., two with gun ammunition) to each infantry division.

Those for S.A. ammunition carry 413,568 rounds and 2,680 revolver cartridges.

Those for gun ammunition contain :—

492 shell,	540 shrapnel,	and 48 case for heavy guns.
912 "	960 "	48 " light "

Movable artillery parks are attached—2 to each reserve division of the 1st category ; 1 to each of the 2nd category, and 1 each army corps. One of these parks contains, if for S.A. ammunition, 343,295 rounds and 5,760 revolver cartridges ; if for gun ammunition :—

246 shells,	270 shrapnel,	24 case for heavy guns.
608 "	640 "	32 " light "

The total number of rounds available per rifle is 196·8 distributed as follows : on the soldier's person in the pouches and pack, 84 ; in the S.A.A. carts, 48 ; in the flying artillery parks, 53·3 ; in the movable parks, 11·5. The number of rounds carried per heavy gun of the army corps is 259·5, viz., 117·2 shells, 129·6 shrapnel and 12·7 case, and per light gun, 268·2, viz., 126·4 shells, 133·9 shrapnel, and 7·9 case.

Local parks would be formed according to circumstances, in addition to the mobile ones referred to above.

Training of the Troops.—Apart from the ordinary exercises by units and manœuvres by mixed bodies of troops, the employment of the several arms in exercises of a special nature is of interest, as showing the earnest desire to train the soldier in a practical manner for war. Such are, for infantry, the practice of night attacks, the attack and defence of entrenched positions, and the "penetrating attack," in which the troops launched to the attack are not permitted to halt until they have penetrated the enemy's ranks. The greatest attention continues to be given to an improved rifle instruction. With the cavalry, distance rides, and swimming rivers continue to be practised, and with this arm also "penetrating attacks" against firing infantry and guns. The artillery have been practised as in 1887 in firing on bivouacs, and in one of these practises the limbers were left behind and the ammunition brought along on the horses of the detachment.

Training of Reserve.—The number called up was 128,379, belonging to the infantry, field and fortress artillery of European Russia and the Caucasus ; the duration of the training was from 21 to 26 days. The classes called up were those of 1883, whose service with the colours had been shortened, and those of 1878, who had served from 3 to 5 years with the colours.

The most important part of the reserve exercises was the trial mobilization of the 31st reserve infantry division and the 51st reserve artillery brigade. For this purpose four companies of the reserve infantry battalions, Nos. 54, 61, 67, 68, and the third battery of the 4th reserve artillery brigade, were brought together, and from these were formed four regiments of four battalions and four batteries of eight guns, without horsed S.A.A. wagons. In order to complete these formations to a war strength, 49 Officers and 15,678 men were called up from the reserve for 26 days. As the number of reserve Officers was not sufficient, the requirement was completed by detached line Officers. The horses were obtained under the special law on the subject from the inhabitants of the district concerned. The men joined between the 21st and 25th August at the place of mobilization, and were placed under canvas till the 5th September, when the mobilized units were forwarded, fully equipped, by rail to the manœuvre ground. The result of the experiment was stated to have been most satisfactory, but it must be remembered that it was partial only in its nature, and it had long been known that it was to take place.

Turkey.

Recruiting.—The result in 1888 of the new recruiting law of 1886 was to furnish a contingent of 40,000 men (1st portion: 1st training class), which allowed of the two reserve classes, 1883, 1884, being sent down. Besides this number, about 23,000 men (1st portion: 2nd training class) were called up for training for a period extending from five to nine months. This training of the men belonging to the Tertib sani (2nd training class) is a clear gain to the armed forces of Turkey, and it is said to have given very satisfactory results. Not including these men, the peace strength of the army was about 185,000 men.

Defensive Works.—The new works on the Dardanelles, Yeni-Kali, and the island of Tenedos were frequently inspected by the President of the Engineer Department. Those situated on the island of Tenedos, at the entrance to the Dardanelles, were finished, and were shortly to receive their complete armament. A scheme was put forward for the construction of some works in the Vilajets of Salonika, Monastir, and Cossowo.

Armament.—During 1888 the final delivery under the contract concluded with Krupp in 1885 for field guns was made, and the Turkish artillery now has 1,000 of these guns (7·5 and 8·7-cm.). A further consignment of 12 coast guns, namely—2 of 35·5 cm. (80-ton guns) and 10 of 24 cm.—was delivered in February, 1889, together with a supply of ammunition for them.

Communications.—The most important point to be noticed is the granting of a concession to a German firm for the construction of a railway in Asia Minor, from Eski Scheir to Angora, a distance of 400 kilometres. As long ago as 1872 a scheme was worked out for the construction of a railway system in Asia Minor. The question has since been frequently discussed, and nine years ago the first step was taken towards carrying it out by the construction of the European portion, from Constantinople (Haidar Pacha) to Ismidt (92 kilometres). But no company with capital came forward to undertake the further portion of the scheme until 1888, when English, French, and Germans competed for the concession. A concession was also granted for a local line from Jaffa to Jerusalem.

The beginning now made will assuredly lead to the extension of railways throughout Asia Minor in due course, and while the importance of this from the commercial point of view should be considerable, it will undoubtedly be of much greater moment from the strategic standpoint. By the construction of a system of railways the rich recruiting ground offered by Asia Minor will be opened up, and it will become practicable to bring the whole resources of the Turkish Empire to bear on an European theatre of war.

Infantry Tactics.

In Germany the series of new regulations, having for their object to bring the instruction of the army up to the level of the latest developments in arms and in the tactics resulting from the introduction of them, was crowned by the publication, on the 1st September, 1888, of the new infantry drill book.¹

Comparisons between the new regulations and those they replaced have been published in many forms, as also in many languages. They show that the emendations and changes in the old regulations are very numerous, but beyond getting at this result the comparison is not of any great value. It will be sufficient to note here that the foundation on which the new regulations are based are, 1st, that the individual instruction of the recruits shall be

¹ For a summary of its contents see No. 149 of the Journal.

as thorough and complete as it is practicable to make it; and, 2ndly, that what is taught throughout shall be applicable to the battle-field. The enormous amount of experience gained during the war of 1870-71, the collation of which has become possible through the publication of numerous regimental histories, and the works of many able writers who took part in the campaign, has allowed of decisions being arrived at as to what formations and movements are absolutely impracticable under effective fire. All such have been either altogether omitted or reserved for use exclusively on formal parades, and the number so reserved has been reduced to a minimum. A reference to the summary already referred to in the note will show how completely this rule has been adhered to. The reasons for it are not far to seek. In the first place, with the shortened service, time is no longer available in which to teach men formations and movements which it is impracticable to use before the enemy without heavy losses being entailed. And, in the next place, experience shows that what soldiers have been taught in peace they will, in the excitement of the battle-field, naturally do; it is, therefore, of double importance to restrict the instruction to such points as will be required in war. One other very noticeable point is the absence from the new regulations of any normal formation for attack, and the absolute prohibition against any such being drawn up or practised.

In France, also, new regulations were issued for trial by the infantry, in May, 1888, but were found to be so impracticable that they were withdrawn. The spirit in which they were drawn up is evidenced by the fact that the five parts into which they were divided contained 766 pages, whereas the German Regulations contain 172.

The issue of new Musketry Regulations gave more satisfactory results. The number of rounds of ball ammunition to be fired yearly is, for the active army, 120; for reservists, 27; and for men of the territorial army, 20. The exercises are divided into individual firing, at which 88 rounds are fired at ranges up to 600 metres. The remainder, 32 rounds, are fired in six practices, in volleys, at 600, 800, and 1,000 metres; one practice being devoted to magazine volley firing (8 volleys in the minute); one practice at independent fire advancing from one position to another, from 600 to 500 metres; and one practice with rapid fire with the sight at 400 metres. In addition to this, 50 rounds are allotted to field firing, and are distributed as follows: two practices at unknown distances, under a non-commissioned officer; one practice in volley firing, under the commander of the sub-division; one practice as a company advancing to the attack from 800 to 200 metres; and one practice as a battalion advancing to the attack in the same way.

The 8th chapter, which deals with the rules for the control of fire, is the most important, and is based on the performances of the new Lebel magazine rifle. Fire control is carried out by units, which should not be larger than a half-company. The commanders of these regulate the beginning, the end, the interruption, and intensity of the fire, the object of which is to produce the greatest possible effect in the shortest possible time. Fire at long ranges seldom repays the expenditure of ammunition; when it is employed, a large number of rifles should be directed on the same object. The employment of fire is ruled by the consideration whether the engagement is of the nature of an attack, of a defensive action, or a rapid assault. In the attack, fire should be opened as late as possible, but then continued with the greatest possible energy and rapidity. As regards the application of the different kinds of fire, the battalion commander points out the object to be fired on, and, as far as possible, the portion of the enemy's line on which the fire is to be concentrated. The Captains regulate the application of the fire and the expenditure of ammunition, and point out the object if this has not been done by the battalion commander. Half-company commanders and non-commissioned

officers superintend the proper arrangement of the sights and the direction of the fire. Volleys are only to be fired by units not larger at the most than a half-company; rapid fire is only to be employed at decisive moments, and magazine fire only on the command of the Officers. The distances are divided into: short (up to 600 metres); medium (600 to 1,200 metres); long (over 1,200 metres). Individual fire is only to be employed up to 300 metres against skirmishers covered or lying down, to 450 metres against single horsemen, 600 metres against groups of four or more men. Concentrated fire is recommended against objects of the breadth of a group up to extended columns and lines from 800 to 2,000 metres, being dependent in a great degree upon conditions of weather. Officers and non-commissioned officers are at the medium and long distances to observe the effect of the fire, and regulate the sights accordingly; in exceptional cases, where opinions regarding the distance differ as much as 200 metres, the sights may be set at several distances. As regards the vulnerability of the several formations, it is stated that the company in line begins to feel the effect of fire at 1,800 metres; the half-company columns and company columns at 2,000 metres; men kneeling are almost as easy to hit as standing up.

The Italian infantry also received in 1888 new musketry regulations, as a result of the introduction of the magazine rifle. As in the cases of France and of Austria during the past year, this issue of the new arm has entailed a material increase in the quantity of ball ammunition allowed for practice.

Cavalry Tactics.

No material changes took place during 1888 in the views already generally accepted in regard to the manner of employing cavalry in war. In the matter of equipment, the days of the cuirass are at an end except as a parade dress; and its use has been discontinued by the German cavalry. The lance, which had fallen into disrepute, and been entirely set aside by some European armies, is coming into favour again, and it seems likely to be established in the high place it formerly held. The question of giving the cavalry a repeating carbine has been freely discussed; but in France alone it was decided to arm the cavalry regiments with one, namely with the Lebel repeating carbine (8 mm.).

In Germany increased importance was given to the use of the carbine by the publication of new Musketry Regulations for the Cavalry. In these it is pointed out that instruction in firing is one of the most important portions of the training of cavalry, and must be carried out in all its parts with the greatest care. Whereas formerly special prominence was given to the training of the cavalry soldier at short distances, it is now prescribed that he is to be equally carefully trained throughout the three classes, for it is at longer distances that fire will ordinarily be possible. In field firing the manner of delivering the fire is restricted to groups and subdivisions; individual firing finds no place. Firing by groups is employed principally at short distances up to 500 metres; by subdivisions at medium and long distances.

The practical value of a more thorough training of cavalry in the use of the carbine was evidenced by an advanced guard exercise carried out over the Hagenau practice ground. A squadron formed part of the body of mixed troops employed, and was utilized dismounted from time to time to direct carbine fire against targets representing an enemy. The results were not altogether satisfactory, and gave occasion for the General Commanding to point out that, though the employment of cavalry with their carbines dismounted would seldom occur, adequate training is indispensable if they are to avoid a check in such cases. The difficulties for the subdivision com-

manders in judging distances correctly in unknown and unexpected conditions, in quietly conducting the fire, and maintaining fire discipline, are clear; constant practice is, therefore, required.

In Russia, judging from the dispositions made for the manœuvres, the theory regarding the employment of masses of cavalry as mounted infantry appears to have continued to lose ground. Great stress was laid upon the importance of cavalry being employed in concert with, or in opposition to, infantry in every manœuvre in which infantry took part. Night manœuvres were practised, and it is thought in Russia that in future wars they will play an important part.

In France the tactical training of the cavalry is seriously interfered with by the number of recruits, due to the short periods of service (generally 3½ to 4 years), and by a number of the remounts being unfit for the field. Including volunteers, each regiment has from 260 to 290 recruits each year; and, judging from the manœuvres, when the Divisions were about 1,900 horses short, the regiments are still worse off in the matter of horses. In these days, when training under service conditions is acknowledged to be of so much importance, French cavalry is placed by these circumstances in a very disadvantageous position as compared with the German.

Field Artillery Tactics.

The issue provisionally of new Drill Regulations¹ for the Prussian Field Artillery in the spring of 1888 will no doubt be followed by the adoption generally of new regulations, the necessity for which has arisen through the changed conditions under which the arm is now employed in the field.

The principal tactical question under discussion has been the bearing on the employment and importance of field artillery fire, of the introduction of magazine arms. In an article in the German military review, "*Mittheilungen über Gegenstände des Artillerie-und Geniewesens*," this question is discussed by Captain Freiherr v. Stipsicz. He arrives at the conclusion that, seeing that it was already impracticable to attack a position held by infantry with ordinary single loaders without previous thorough preparation by artillery fire, the necessity for this will be enhanced in the case of the defenders being armed with repeaters. To ensure this thorough preparation, he urges:—

1st. The most extensive employment possible of the fire of artillery masses;

2nd. That sufficient time be allowed in which to bombard the place at which the assault is to be made;

3rd. The direction upon this and also on the reserves of a powerful fire;

4th. Immediate accompaniment of the attack, especially by those batteries that are masked by the infantry, up to 675 or 750 metres.

These principles for the employment of artillery must exercise an influence on the organization of the field artillery, for they will necessitate a strong corps artillery. The deductions drawn by the writer for the training of field artillery in peace are three:—

1st. The most important is its instruction in every phase of fire action; more attention must be paid to firing at long, even very long, ranges.

2nd. The training in firing by masses must be attended to much more than hitherto.

3rd. The great mobility and power of manœuvring of the artillery will form one of the most important factors in firing by masses.

With the exception of the increased importance given by the writer to

¹ For a summary of contents see No. 149 of the Journal.

practice at very long ranges, his views are no doubt practical and just. The necessity for a good and strong artillery to silence the fire of the enemy's guns, and to search out that portion to be attacked, and so increase the chances of success from the infantry attack, is still greater than it was before. He who remains the victor in the artillery engagement is apparently the victor in the battle.

Fortress Tactics.

The report on this subject is divided into two portions. The 1st treats of the defensive works undertaken by the several European States, the improvement of matériel, and the organization of fortress troops. The 2nd portion is reserved for the discussion of various questions relating to fortress warfare which have been raised in the press.

As being intimately connected with the defence of the frontier, the following comparison is drawn between the lines of railway available and projected at the disposal of Russia and Austria respectively. The former has six lines which lead to the Western frontier, of which the first stops a few miles short of it; these are:—

1. St. Petersburg—Warsaw—Czenstochow.
2. Moscow—Minsk—Brest-Litovsk—Kielce.
3. Kursk—Pinsk—Ivangorod.
4. Kursk—Kief—Lub.
5. Charkof—Balta—Proskurof.
6. Odessa—Schmierinka—Proskurof.

Under certain conditions the line Odessa—Kischenef—Jassy could also be utilized.

The projected lines are four, namely:—

1. Lodz—Sierad—Wilhelmsbrück or Sierad—Kalisch.
2. Kutno—Kolo—Sluzce.
3. Pinsk—Kowel.
4. Lublin—Zamosk—Tomazof or Lublin—Ostrovica;

the main directions of which lead also to the German or Gallician frontier.

Austria has the following lines:—

1. Prague—Olmütz—Prerau—Oderberg—Cracow—Stryi.
2. Josephstadt—Prerau—Odbý—Cracow.
3. Brünn—Prerau—Oderberg.
4. Pressburg—Pesth—Chyrow—Lemberg.
5. Vienna—Sander—Chyrow—Stryi.
6. Kaschau—Tarnow.
7. Graz (Agram)—Pesth—Debreczin—Munkacz—Stryi.

These will not suffice in the future, particularly as on some portions of the system several lines run in common, and further strategical lines are in contemplation.

Italy also has not been idle in the matter of connecting her fortified places on the coast with the interior, for which purpose contracts have been concluded for the construction of the following lines:—

1. Velletri—Terracina.
2. Sparanise—Gacta.
3. Avellino—Ponte S. Venere.
4. Genoa—Ovada—Asti.
5. Cernia—Piombino.
6. Cuneo—Saluzzo.

Besides these, the line Udine—Portogruaro is to be completed during the year, after the difficulties offered by the bridging of the Tagliamento have been overcome. Special attention is being paid to coast defence, as is evidenced by the construction on the island of Caprera of three forts, and on Maddalena of four forts, with good roads and landing places, arsenal, barracks, hospitals, and magazines. The two places are further to be connected by a bridge. The extensive works at Spezia are being continued, and several new forts have been designed. Large expenditure is also being incurred for the equipment of fortresses, construction of heavy guns, engineer matériel, and siege trains.

France and Russia have also turned their attention to coast defence—the former in connection with Toulon, Brest, and Cherbourg, the latter in the conversion of Libau into a fortified port at great expense. The importance of this port is due to the fact that at a time when the northern port is closed by the ice, Libau is open and available for the entry or egress of Russian vessels.

The works in progress in Belgium for the preservation of her neutrality, both on the Meuse line and the modifications in the fortified places of Antwerp, Termonde, and Diest, to meet the most modern ideas, have already been alluded to, and they should be completed in two or three years.

Switzerland, also, having in view the maintenance of her neutrality, has voted the necessary money for the construction of defensive works at Andermatt, on the St. Gothard.

At Bukarest, of the eighteen forts to be constructed to complete the system of defence, seven were completed during 1888, and three more commenced.

In Turkey the question of the land defences has at last been seriously taken up; an entrenched camp is to be formed at the lines of Tschataldja for 50,000 men, and the defences of Adrianople are to be reconstructed.

Amongst the improvements in matériel, perhaps the most important is the development of high explosives, and their adaptation for purposes of bombardment and mining. The Report, while referring to them and to the acknowledged difficulties in the way of their practical use in war, gives no details as to the experiments carried out in various countries, and especially in Austria. In one form and another the problem has been under consideration during the past ten years, and one important result has now been reached. Shells loaded with a high explosive substance have been fired with success, and practically without danger; but this has been under peace conditions. In war the difficulty of transport, and the fear lest atmospheric conditions, such as damp or heat, should set up chemical changes of a dangerous nature, must, in the present state of knowledge, at least limit, if it should not altogether prevent, their use.

The question of rapid communication in war continues to attract attention, and during the past year some interesting observations were made on the subject in France. From these it appears that 1 kilometre can be covered by a pigeon in 1 minute, by a hound in 2 minutes, by a bicycle or a mounted man at a gallop in 3 minutes, and by the latter at a trot in 4 minutes. The establishment of the pigeon post on an extensive scale in Russia has already been referred to. In connection with the operations about Massowa, the Italians have made practical use of the pigeon post with excellent results. Communication is not only regularly maintained between the outlying posts and the chief station at Massowa, but reconnoitring patrols take with them pigeons in baskets, to enable them to communicate intelligence rapidly back to the station from which they were sent out. If a pigeon arrives back without having a message attached, and with some of its tail feathers pulled out, it is an intimation that the patrol has been surprised.

It appears, also, that in Italy a way has been found of maintaining balloons

in the field, or before an invested fortress, for purposes of observation, without the encumbrance of a bulky train. Small balloons, suitable for one observer, have been constructed for the expeditionary corps in Africa, the necessary gas for their inflation being contained in an easily transported, small, steel cylinder. The entire transport per balloon consists of three vehicles.

The same difficulty, namely, the necessity for a bulky train, is encountered in the application of the electric light for the purposes of fortress warfare. Experiments made in Austria showed that with three wagons a powerful light can be obtained and maintained, capable of being rapidly moved. Both in Germany and in Spain experiments were made in night operations, both the ground and the object being lighted up by the electric light. In the case of the Spanish trials, it was found that in individual firing under peace conditions the hits were as 74 by day to 33 by night; but in field firing under service conditions the results were about equal. The German experiments showed that those men within the sphere of light made better practice than those without it.

Great attention has been, and continues to be, paid to the employment of quick-firing guns in fortress warfare. In Germany, experiments conducted at Krupp's factory with these guns, varying in calibre from 4 to 13 cm., of which the two heaviest, namely, the 10.5 and 13-cm. guns, appeared the most suitable for fortress warfare. The time occupied in firing one round was four and five seconds respectively. Italy has adopted the 12-cm. Armstrong Q.F. gun for use in her navy, and also the 25-mm. Maxim machine gun.

The organization and training of the troops specially reserved for fortress warfare were advanced in many European states, and Italy showed herself especially active in this direction, carrying into effect the changes in organization prescribed by the law of 1887. For the fortress artillery this entailed the increase of two of the five regiments by one division of four companies. In consequence of the increase in the number of the field artillery regiments, the numbering of the fortress artillery regiments had to be altered, and they are now numbered and their headquarters located as follows: the 25th at Ancona, the 26th at Genoa, the 27th at Rome, the 28th at Mantua, and the 29th at Capua. The instructions prepared for mobilization provide for the constitution of the following formations by the fortress artillery:—

1st. A brigade of fortress artillery for each army, consisting of the staff and one company (4 Officers, 225 men).

2nd. Troops for the artillery siege park; to be composed ordinarily of the materials for forming the park, guns divided into groups for transport, ammunition equally in groups, supplementary group (laboratory, stores, tools, materials), and the troops themselves consisting of the artillery train for the military vehicles and twenty-four companies of fortress artillery.

3rd. Garrison troops for the fortified places within the theatre of war.

4th. Garrison troops for the coast batteries.

5th. Artificers for the army artillery park.

The effect of the reorganization of the engineers has been to increase the available force of that arm from 7,000 to 8,000 men. A further step in the reorganization of the fortress troops has been to form a separate class of Officers from those employed in fortresses, to be attached to the infantry. The list consists of 6 Colonels, commandants of fortresses or forts; 9 Lieutenant-Colonels, and 16 Majors, as commandants of forts or assistants to the commandants of fortresses; 19 Captains, as commandants or assistants; and 16 Lieutenants as assistants. Besides the instruction in firing and the ordinary duties of a fortress, regular fortress manœuvres are held for all the troops allotted to them.

Russia has also taken steps to give the necessary training to the reserve

cadre-troops, which would be in great part allotted to the defence of fortresses in war. The composition of the fortress artillery in Russia for war purposes is as follows :—

1st. The siege park, consisting of 6 fortress battalions and 1 transport division.

2nd. 50 fortress artillery battalions, each of 4 companies (except two, which have 5).

3rd. 6 independent fortress artillery companies, distributed throughout the country.

4th. 3 fortress artillery detachments, each of 100 combatants, in Odessa, Nikolaief, and Astrabad.

5th. 16 sortie batteries, each of 8 guns and 2 ammunition wagons, for the larger fortresses, namely, Warsaw, Novogeorgiesk, Brest-Litovsk, Ivangorod, and Kovno.

There are in Russia two engineer siege parks, each in 4 divisions of 24 park wagons and 4 field forges. The engineer personnel for fortress warfare is formed by means of the expansion of the 5 companies into 34 reserve companies engineers (each of 224 combatants), of which 16 for siege duties and 18 for field work.

In France the amalgamation of the fortress artillery and engineers, contemplated by General Boulanger when Minister for War, has not been proceeded with.

In Part II of the Report on Fortress Tactics, the question of the value of permanent fortresses and forts is discussed with reference to the theory advanced during the autumn of 1888, to the effect that, looking to the progress made by artillery, especially in the use of projectiles charged with high explosives, permanent works have lost their defensive value. The alternative suggested was the construction, as tactical considerations might dictate, of provisional earthworks, to be furnished with armoured towers and shelters, made with the special view to their transport from place to place. In the Report the fact is accepted that, in the field, attack and defence will be more and more a matter of position warfare, and so become more or less assimilated to fortress warfare. But the argument from this, that permanent fortresses and forts can be dispensed with, is combated. The inferences drawn from the experiences of the 1870-71 war are not to be depended upon, for it is only since that war that the study of, and instruction in, fortress warfare have been seriously taken up. Had the French fortresses been defended with the knowledge and skill that have since been gained, the results might have been different. The existence of permanent fortifications does not prevent the construction, when tactical considerations require it, of strong provisional positions, as was done at Düppel, Plevna, Sebastopol, and frequently in the American war. The writer of the Report, therefore, lays it down as his opinion :—

1st. That a rational system of land defence will always be connected with such defences as are already in existence, and will not experiment with extensive changes in the fortifications.

2nd. That, looking to the value attributed to fortresses in all ages, it is not justifiable to introduce a new era of provisional fortifications, notwithstanding some examples in war which seem to favour these.