OCCASIONAL PAPERS AND NOTICES OF BOOKS.

This portion of the Number is reserved for Articles, either Original or Compiled, on Professional Subjects connected with Foreign Naval and Military matters; also for Notices of Professional Books, either Foreign or English.

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THE MILITARY POSITION OF ITALY.

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THE "*Italia Irredenta*" party agitates unwearingly for the "liberation" of the "unemancipated" provinces of Trentino and Trieste; *i.e.*, it eggs on the Italians to war, and has so far been successful, that Austria has, in consequence, considerably reinforced her garrisons in the South Tyrol, and has taken in hand the completion of her fortifications on that frontier.

In the actual military conditions of the two States, it might not appear so hazardous for Italy to attack the Austrian Monarchy, when it is considered that she is fortunate enough to be able to reckon on a powerful ally, in a position to draw off the mass of the Imperial troops to a distant theatre of war, and hold them there. But if, as has been set forth in one of our late numbers, the South Tyrol is very much exposed to be outflanked from the eastward; and if Italy also has done much towards the completion of her military system, the conditions subject to which her forces would take an offensive rôle are, in general, not particularly favourable; and, apart from numerical inferiority, the offensive and defensive power of the young State still suffers from serious defects. Considerable time is still required to remedy them, so that the advice and the pressure exercised by the *Irredenta* party may occasion complications and even considerable dangers for the Italian Government.

To depict these conditions of the military strength of Italy, her strong and weak sides, as disclosed in the rich material of the various works which have lately appeared, is the object of these lines.

The field army of Italy which would be available for operations on the expiry of the two and twenty days required for mobilization, consists of ten army corps, each of which is made up of two divisions and a reserve. Each division comprises 12 battalions of infantry in 4 regiments, together with 2 squadrons and 3 batteries, each of 8 guns. To the reserve belong one regiment of Bersaglieri of 4 battalions, a cavalry brigade of 8 squadrons, and 4 batteries of corps artillery; together with engineers, a pontoon train, and transport, &c.

The guns are either the Krupp 9-cm. or a 7-cm. bronze breech-loader. The fighting strength of a corps is about 27,000 men. Until 1878, special cavalry divisions did not exist. A peculiar feature of the Italian Army are the Alpine battalions. Recruited in the Alpine valleys, they are quartered always in the districts in which they are raised, and are maintained at their full establishment of 5 Officers and 250 men. They are, consequently, soon ready to move, and serve to cover the development of the mobilization. There are 10 battalions comprising 36 companies, attached to which are 36 reserve companies, a number which can be further increased to 72. The establishment of the latter is 5 Officers and 200 men. They are composed of the recruits of the active company. 8 mountain batteries of 6 guns each aid in the defence of the mountain passes. They are manned from the 4 fortress artillery regiments, which together number 60 companies.

After the standing army comes the Landwehr. After the Italian soldier has served three years in the active army and six in the reserve (the cavalry soldier five and four years), he is transferred to the *Milizia Mobile*. This body is formed into 10 divisions, to conform to the number of the troops, and has on paper (for neither reservist nor landwehrman is ever called out) a strength of 130 battalions, 30 batteries, 20 artillery and 10 engineer companies; besides the brigade of 8,000 men complete in all three arms allotted to the Island of Sardinia. The Militia is armed with rifles of old systems converted to breech-loaders, of which arms there are 600,000 available. These are, however, to be replaced by Vetterli rifles; and of the requisite 220,000, 60,000 will be ready this year.

The batteries which are fully equipped are armed with old-fashioned bronze muzzle-loaders, but there is, however, a reserve of 144 new breech-loaders for the standing army. To make matters worse, 50 per cent. of the Officers of the Militia are deficient.

The garrisons of fortresses, the troops required to cover the open cities of Naples, Palermo, Leghorn, Taranto—the exposed positions of Sicily—brigandage, &c., would absorb so many from the Militia, that but very few would be available for the formation of reserve divisions, such as were formed by Germany during the war with France.

Next to the *Milizia Mobile* follows the *Milizia Territoriale*, in which the period of service is seven years. This species of Landsturm is not organized even on paper, but in a prolonged war would afford to the military administration a productive source from whence to fill up the ranks of the Army; for among the ranks of the “*territoriale*” are to be found 200,000 trained soldiers.

Like the German *Ersatz* men and the French *deuxième portion*, Italy also possesses a *seconda categoria*, whose period of instruction is fixed at 150 days nominally, but is generally limited to 40 or 50. Five contingents of this second category belong to the standing army, and furnish 232,000 recruits. As the nine contingents which form the standing army and reserve number 498,000, the gross total available for the organization of an Army mounts to the considerable figure of 730,000; and if the requisite number of Officers could be found, new formations on a large scale might easily be made, for there are 440,000 Vetterli rifles disposable.

The liberal complement (4 Line Officers and 1 Reserve Officer per company) of Line Officers is 750 short of the establishment, and the Militia wants 1,700; although in Italy not only the one-year volunteers, but also the non-commissioned officers after 12 years' service, obtain commissions in the reserve.

A not unimportant numerical reinforcement, upon which Italy can securely reckon in case of a national war, are the Volunteer Corps, which in 1866 numbered 40,000 men.

Glancing over the aggregate of the Italian Field Army, which, with its

280 battalions (each 820 strong), 120 squadrons (of 120 combatants), 848 guns, and 108 Alpine companies, numbers about 250,000 bayonets, and 14,400 sabres, the small proportion of cavalry is striking.

This is explicable, on the one hand, by the poverty of the land in horses; and, on the other, by the fact that the plains of Upper Italy, with their rich vineyards and mulberry culture, their rice fields, &c., as well as the mountainous districts of the Appenines and Alps, scarcely admit of the deployment of large masses of cavalry. Should the contest be confined to the plain of the Po, and to the districts of the Tyrolean and Carinthian Alps, this slight provision of cavalry might suffice; but the want will make itself apparent, if the Italian Army, with a view of bringing about the secure possession of the already conquered district of the South Tyrol by the conclusion of a peace, is forced to seek an objective in the interior of Austria, at Vienna or Pesth. For although frontier provinces may be overrun, peace is often brought about only when the victorious invader stands before the unprotected centre of national life. In her efforts to gain the Tyrol and Istria, Italy should therefore contemplate the possible need of offensive operations of a much wider scope. Hence, an invading army advancing from the Adriatic and the Pusterthal on Vienna has need of a strong cavalry force to secure itself on the side of Croatia and Hungary against the valiant and active horsemen of the Austro-Hungarian Army. Now not only does Italy not possess an adequate number of squadrons, but these units, even on their peace establishments, are always short of their complement, thus making a deficiency in the gross of the cavalry arm of some hundreds of horses. These wants, too, are hard to remedy; for Italy, simply on account of her poverty in horses, has hitherto had to supply the needs of her Army by purchase abroad, especially in Hungary—a source which, as well as North Germany, is liable to be suddenly closed against her.

This want in serviceable riding and draught horses is a point of special interest with regard to the capacity of the Italian Army to undertake operations in the field. The number of effective horses and mules in the country covers, indeed, the actual requirements of the first line of the Army, and the transport columns appertaining to it, amounting to 37,000 horses and 22,000 mules; but for the train in second line draught animals are wanting, and the expedient of road locomotives or traction engines has therefore been resorted to. Upon hard level ground, such as the excellent roads in the valley of the Po, these engines are very useful, but they can only ascend with difficulty inclines of 1 in 100; they require a large supply of water, and consequently need that the district they traverse should be rich in springs and streams; and in the frequent sharp turns of mountain roads a subdivision of the train drawn by them becomes requisite, and consequently they could hardly be used in an offensive operation in the valleys of the Drau and Save. The whole system of maintaining a supply of provisions, &c., from the rear would therefore become very precarious, and the offensive would thereby be cramped—disadvantages which, in an advance over the steep and barren Karst district, or in a halt upon it, might occasion a total discontinuance of the supply of provisions, if the railway, which certainly would have been destroyed, could not be put into working condition.

Besides the deficiency in Officers, the weakness in cavalry, and the insufficiency of teams for the trains, another unfavourable condition is to be observed in the delay in mobilizing, which arises from the slight capabilities of the Italian railways, and the peculiar composition of the regiments. From motives of a political nature, and in order to impress the conception of a common fatherland and bond of connection on the very heterogenous elements of the lately unified State, no localization in the provinces has been adopted as in Germany, but every regiment is made up of equal proportions of Lombards and Sicilians, Piedmontese and Romans, &c. The whole country is

divided for this purpose into five zones and eighty-eight military districts, from the first of which each regiment receives every year a like proportion of its contingent of recruits. For the infantry regiments, each zone furnishes a district, five consequently in all, from whence the contingent of its recruits is drawn; and in the special arms they are furnished from eight or nine such districts. Inasmuch as, in case of war, the regiments receive all their own men back again, this system of distributing the recruits renders the smooth development of the mobilization uncommonly difficult.

The latter operation is conducted in the following manner :—Within forty-eight hours after the receipt of the order, the foot regiments must be ready to march off on their peace footing to the point of concentration of the Army; having arrived there, they receive their reserve men, who have been fully equipped and sent forward by the Commandants of the military districts. These district commands, double as numerous as the German Landwehr district commands, have consequently to do the whole work of the mobilization. The equipment magazines of the infantry and Bersaglieri reserve are in their charge, as well as those of the Militia; they have to requisition the horses and mules, to embody the militia and to dispose of the second category—an overburdening which can only produce confusion. Artillery and cavalry only fill up at their stations and put themselves on a war footing in their garrisons.

These regiments should be ready to march on the seventh day, the batteries in the "second formation," *i.e.*, with six guns. On account of the difficulty in railway transport, both regiments of Engineers and most of the regiments of Artillery are stationed in Upper Italy and Tuscany, where, likewise, on account of the abundant barrack accommodation in Lombardo-Venetia, six of the ten army corps are located.

From the calendar for mobilization, and from the debates in Parliament, the following information has been derived :—

1st day.—Issue of orders.

2nd to 7th days.—Collection of rolling stock of railways. Transfer of the Alpine battalions from those parts of the frontier which are not menaced. Commencement of transport of infantry and Bersaglieri to the theatre of war. Summoning up men on furlough. The first batches of reserve men probably come in on the 6th day.

8th day.—Dispatch of the reserve men for filling up artillery and cavalry.

9th to 15th days.—Dispatch of the infantry reserve men to the theatre of war.

15th day.—Completing the batteries to eight guns.

15th to 22nd days.—Completion and dispatch of the trains.

22nd day.—Commencement of transport of enrolled militia.

The mobilization, and the forward movement or concentration, are thus closely interwoven, the latter being dependent on the enemy in some measure. The first opposition, executed with feeble forces, may be met by the Alpine battalions. More serious enterprises on the part of the two Austrian corps, which will be the first to take the field, may be anticipated after the 8th or 10th day, earlier than which no portion of the Austrian Army can be mobilized, and will be opposed by the Italian 3rd and 5th Corps, stationed respectively at Verona and Bologna, each numbering from 10,000 to 12,000 bayonets; and some days later perhaps also by the 2nd and 4th Corps from Milan and Piacenza. A general offensive movement, however, which might be undertaken by an enemy already mobilized, on the 15th or 16th day, would catch the still concentrating Italian Army in the full activity and confusion of augmentation by the reserves, for the most part without transport or ammunition columns, the roads covered with detachments marching to join their regiments, the railway stations full of trains unloading, and the Verona-Treviso line blocked with a mass of trains. The lines of the Tagliamento and of the Piave, which are tolerably strong, and whose few bridges

can be easily protected by extemporised fortifications, and the Bar Forts to be constructed in the Alpine Valleys, must help the Italian Army through the difficulties of this period, otherwise the concentration must be effected more to the rear, behind the Brenta or the Adige.

It remains, however, questionable whether the mobilization and concentration (*Strategische Aufmarsch*) can be completed within the twenty-two days, for on the one side the Italian railways, which do not belong to the State, but to three great private companies, have yet to undergo the crucial test of actually transporting bodies of troops on a grand scale, and on the other the whole execution of such a task upon them has to contend with numerous hindrances.

In general terms there are four lines of railway available :—

1. Turin, Milan, Verona, Treviso.
2. Coni, Cremona, Mantua, Verona.
3. Naples, Rome, Bologna, Mantua.
4. Reggio, Bari, Ancona, Bologna, Ferrara, Padua, Treviso.

The upper station lines have only short sidings, which in lieu of the military trains of 90 to 100 axles usual elsewhere, will only admit of 57 axles. The line along the Adriatic coast is over long sections exposed to the fire of a hostile fleet, and subject to be blown up by daring enterprises undertaken by small vessels of light draught; indeed the whole traffic may thus be interrupted for a long period. The transport of the 9th Corps from Bari, and the 10th from Palermo must then be effected by means of one of the two or three transverse lines which connect the railways lying east and west of the Apennines, thus passing into the districts traversed by the trains carrying the 7th Corps from Rome and the 8th Corps from Naples, and naturally occasioning fresh complications and more waste of time. Further, the passage over the Apennines from Pistoia to Poretta will only admit of trains of 40 axles on account of the steepness of its inclines, a disadvantage which will be removed by the construction of another and better cross line from Pontassieve to Imola. Finally, the rolling stock is said to be insufficient, and 100 engines are wanting.

As regards transport by sea, the 79 steamers of the navigation companies can carry 70,000 men and 8,900 horses. This means is less adapted to a rapid movement on the Tagliamento on account of the tedious operations of embarkation and disembarkation, especially at Venice, and on account of the length of the journey, than for a landing on the Dalmation or Albanian coasts, as suggested by the Italian propaganda.

Should the Italian Army meet with a defeat, and be driven back under the shelter of its fortresses, its prospects in this direction are not the most brilliant. The advanced line of defence is formed by the Tagliamento, the Piave, and the Brenta, which, when the Bar Forts projected in the Alpine defiles at the upper courses of these rivers have been built, may be held for some days. Then comes the strong line of the lower Po, the Adige, and the Mincio. A whole row of fortresses lies along this line, but almost every one of them is defective in the modifications and improvements rendered necessary by modern artillery.

Venice, an important maritime fortress, situated far from the mainland, and only connected with it by a long railway bridge, and by the *tête-de-pont* of Malghera, can offer little support to the land army.

Verona, the sally-port of the Tyrol, was strengthened by the Austrians with forts on the west and south sides, but on the north was only secure against being stormed. In connection with Pastrengo and Chiusa it closes the upper valley of the Adige well, but needs remodelling, and almost turning round, so to speak. If we are not mistaken this was discussed during the last year. Moreover, the forts at Verona belong to a period when the modern changes in artillery and fortification were still in their infancy.

For the completion of the fortress of Mantua, which is so important in connection with Bologna for the defence of the line of the Po, nothing has been done ; a *tête-de-pont* on the Po is wanting.

Bologna, which as an entrenched camp, is not only of importance in connection with the defence of the Po, but is of the greatest value as a position in front of the Appenines and their defiles, is totally neglected.

It has indeed an enceinte secure against escalade, but the ramparts of the outer line and of the advanced forts are in ruins, and are dominated by heights situated too close to the body of the place. There are some small Bar Forts of no consequence on the roads to Spezzia, and on the passages over the Appenines.

Rome is skilfully fortified according to modern principles, and is thereby not only secured against enterprises from the sea, but is converted into an important nucleus for the defence of Central Italy. Thirteen new forts, of which half are already finished, and the others in progress, engirdle the ancient city walls, which are proof against escalade. The forts are semi-permanent earth-works, with masonry bomb-proof casemates, and the larger ones are armed with 28 heavy guns. Before Rome, if it is equipped as a strategical fortress, a victorious Austrian Army must in any case make a halt, and commence a new phase of the campaign.

In the defence of the middle Po, Piacenza also comes into consideration. Its works are well preserved, but of an antiquated system, and its *tête-de-pont* is extremely weak.

Peschiera, the starting point of an offensive operation directed against Riva, is in the same condition as when it was taken over by the Italians in 1866. According to recent information a fort is to be erected at Malcesine, where the North Italian frontier joins the Lake of Garda. It will form a port for the Garda Flotilla, which now consists of three paddle steamers and four gunboats. Troops landed here may be employed to outflank the Austrian fort of S. Nago.

To recapitulate the whole, the principal lines of defence on the Po and the Appenines are entirely wanting in the necessary points of support for an army fortified according to modern requirements, *i.e.*, in bridge heads, in bar forts, and in entrenched camps.

As against a hostile fleet the condition of affairs is as follows :—The coasts of Italy are in general not favourable for a landing, but many of the great emporiums of trade situated in large bays, and with good anchorages, are open to the attack of an enemy :—Leghorn for instance, which possesses a good but badly fortified port :—Naples, where the coast for a considerable extent admits of landing from large vessels :—Taranto, whose excellent harbour is easy to fortify if money were forthcoming :—Palermo, likewise, and most of the Sicilian ports. And moreover in Southern Italy and Sicily the people are somewhat inclined to insurrection, the ferment of Bourbonism still enduring among them. The disadvantage of the exposed position of Naples is still further enhanced by the proximity of the island of Ponza, whose excellent harbour affords a good anchorage for a hostile fleet. The same may be said of Elba, whose six unprotected harbours would afford a favourable base of operations against Genoa and Leghorn. In the wars of England against the First Napoleon, these islands became frequently the points of support of the English Fleet. On the Adriatic coast also there exist suitable positions. Its northern half is unapproachable by large ships, on account of the shallow offing, but the numerous small ports of Ortona, Pescara, Rimini, &c., afford to small and quick vessels localities suitable for surprises directed against the railways ; and since the port of Ancona is now unadapted for large ships on account of its sanding up, this former military harbour now affords little protection to the open coasts. Exposed in like manner to hostile enterprises is the very useful roadstead of Manfredonia, whence the bifurcation of the Foggia line can easily be destroyed ; and the good harbour of Brindisi. A

rich field for enterprises on either a large or a small scale is here offered to the Austrian Navy, particularly during the Italian mobilization.

The Italian Fleet which will have to protect these open points, and eventually to close the Straits of Otranto, numbers 13 heavy fighting ships, viz., 1 ram, 9 armour-plated frigates, 2 armour-clad corvettes, and 1 armoured gunboat, besides 49 smaller vessels, some of which are not on the effective list. There are 4 armour-clad ships in construction, among them the colossal "Duilio," which will be ready this year, and 2 smaller vessels. There is further a special Torpedo Corps.

In the Mediterranean this fleet is based on the military port of Spezzia, which is excellently fortified both by land and sea; and in the Adriatic on Venice, the main entrance channel to which is being dredged out to a depth of 9 metres (30 feet).

The other coast fortresses all suffer more or less from considerable disadvantages. Ancona, strong on the land side, but weak towards the sea, has been abandoned as a marine establishment. The old defences of Genoa are weak on the west and on the sea side, and the latter would be unable to shelter the crowded and close-built city against a bombardment, for which purpose floating batteries such as the "Duilio" will have to be employed. Gaeta alone is strong, and as a secure anchorage for a fleet indirectly covers Naples. This city and Genoa, &c., will fetter the movement of the fleet in a maritime war.

The Austrian Fleet, available for attack or defence, numbers 11 armour-clad and 46 smaller vessels. It has only one or two emporiums of trade, and but a short extent of coast to cover, and has therefore more freedom of action and consequent superiority in that respect. The steamers of the "Lloyd" company are at its disposition.

The Austrian land forces are well known. They comprise 540 battalions of line and reserve, 245 battalions of Landwehr, 354 squadrons, 1,600 guns; an excellent supply of rifle shots, of horsemen, and of horses is available, and above all the superiority which the memory of so many heroic campaigns in Italy bestows.

Let us hope that both nations have not resolved to sacrifice the flower of their youth on the battle-field.

THE RUSSO-GERMAN FRONTIER IN 1880.

WHEN the territories of two great Powers are conterminous, however closely connected the reigning families, however intimate the relations between the two peoples on account of a supposed permanent similarity of interests or on account of a temporary alliance to gain some object of equal importance to both, the rulers of each nation must feel that such a state of harmony between near neighbours is not likely to be everlasting, and that they will be only acting in obedience to the dictates of common prudence if they provide, betimes for the day when that harmony will be disturbed, and when circumstances arise—as will surely be the case sooner or later—to convert the dear friends into bitter foes. Precaution and timely preparation are especially needful when the boundary between the two States is rather artificial than natural. Since the settlement of 1815 Prussia and Russia have been in the position above described. The former nation, released as it had been with the help of its ally from the French yoke and still quivering with agony from the effects of its sufferings, actuated by sentiments of gratitude and at the same

time conscious of its own comparative weakness, was for many years afterwards satisfied to play the part of a faithful and humble friend towards its gigantic neighbour; yet even in those days of dependence Prussian statesmen ventured to show that they were not inclined to be quite at his mercy, and after carefully feeling their way lest they should offend Russian susceptibilities, began to prepare a barrier against possible aggression by renewing and strengthening the fortifications of Thorn, as we shall presently see, one of the most important points in the line of defence. As the nation increased in strength the Prussian Government gained confidence and showed its independence by continuing the work of fortification along its eastern frontier, always, however, taking pains at the commencement of each new construction to repeat its protestations of friendship towards the State against whose possible enmity it was providing.

The long intimacy between Prussia and Russia was never seriously disturbed until after the former developed into the German Empire. During the Crimean War Prussia maintained her neutrality, the sympathies of the ruling classes, though not of the people at large, being with Russia. During the last Polish rebellion the Prussian Government again gave evidence of devotion to that of Russia.

The latter more than repaid her neighbour for these good offices by the attitude which she in turn maintained in 1866 and in 1870-71, and the alliance between the two States seemed firmer than ever.

But the time was fast approaching when the relations between them would be sorely strained. The mighty German Empire had meanwhile inherited the position formerly held by Prussia with regard to the Empire of the Czar, but with no occasion for, and with no intention of, playing the subservient part to which Prussia had for so long a time submitted. On the contrary, suddenly raised as it had been by its own exertions to the first rank amongst nations it was inclined to dictate to all. We are not yet sufficiently acquainted with the secret history of the last few years either to be certain of what really has happened or to form any positive opinion as to what is likely to happen, but we know enough to be convinced that the war between Russia and Turkey and its consequences have seriously impaired the friendship between the former Power and Germany, at the same time bringing the last-named State into closer connection with Austria; also that there is a strong feeling of animosity in Russia against Germany, because the German Government is believed to have aided the Western Powers in depriving the victor in the late war of the principal fruit of his victories and in preparing obstacles against his further encroachments. This feeling has given rise to violent attacks on the part of the Russian press and to equally violent replies by German writers. The mere fact of such a paper war having been permitted by two Governments perfectly able to prevent it had they wished to do so naturally caused serious apprehension, leading many to think that war was imminent. Externally, however, things have to a great extent quieted down, but a feeling of insecurity still exists; and it is therefore not surprising that the eyes of soldiers in all countries should be directed towards that North-Eastern German frontier which may perhaps ere long be the scene of a great struggle; still less surprising is it that Officers of the nations most immediately concerned, and of one contiguous to both and almost as much interested in the question as either should be reviewing the condition of affairs on the frontier and discussing the relative prospects of success in the event of war.

We are not acquainted with any production of a Russian pen upon the subject, though doubtless there are such, but we have before us two interesting studies which appeared towards the end of last year; the first at Vienna, by an Austrian Officer, Captain Kirchhammer, and entitled "*Deutschlands 'Nordost-Grenze'*" (the North-Eastern Frontier of Germany); the second at Berlin, under the title of "*Die Befestigung und Vertheidigung der Deutsch-*

"Russischen Grenze der Deutschen Armee dargestellt von einem Deutschen "Offizier" (The Fortification and Defence of the Russo-German Frontier reviewed for the benefit of the German Army by a German Officer).

We propose to present to our readers a short description of the frontier, of the principal fortifications which defend it on each side, and of the lines of communication between the frontier and the interior of each State, drawing largely upon the two publications above-mentioned for our information, and giving in conclusion the views of the two authors, which it is interesting to compare, as to the strategical and tactical advantages on each side for purposes of attack and defence.

No one can look at the map of Europe without being struck by the extraordinary configuration of the Russo-German frontier, which is identical with that established in 1815 between Prussia and Russia, and the outline of which was determined by historical rather than by geographical considerations. The old Kingdom of Poland, which has since 1815 formed part of the dominions of the Czar, is driven like a huge wedge (200 miles¹ in thickness) into the body of Germany within 200 miles of its heart (Berlin); whilst the advanced provinces of Germany enfold Russian Poland like two mighty arms, the left and longer one (East Prussia), extending some 200 miles; the right one (Silesia) some 70 miles behind its foremost point, the latter arm being prolonged for a further distance of near 200 miles by the Austrian province of Galicia. The extremity of Germany's longer arm is, however, not less than 500 or 600 miles from the heart of Russia, whether you consider that heart to be St. Petersburg or Moscow.

At first sight this position would appear to give Russia great offensive power; and so it would, if things remained now as they were in 1815; but as we have already had occasion to notice, Prussian statesmen were never blind to the danger and took early steps to remedy it. Their plans have in later times been carried out systematically, whilst much less has been done on the other side; and we shall see further on how the natural geographical conditions of the frontier have been modified by art so as to alter greatly, if not entirely to reverse from the strategical point of view, the relative position of the two Empires.

The total length of the frontier line, without reckoning its smaller windings, is about 750 miles, measuring from Nimmersatt (N.) to Mysłowitz (S.). Throughout the whole of this long extent of country there is hardly a hill on either side of the boundary except in Southern Silesia. There are, however, some geographical features of importance for defensive purposes. Such are the series of lakes in East Prussia which to a great extent cover the south of that province; the marshes within Russian territory along the upper course of the Narew; the Drewenz, a navigable tributary of the Vistula, which joins that river just above Thorn after serving for about 40 miles as the boundary; the Vistula itself, the lower part of which is valuable as a second line of defence for Germany, whilst the middle portion covers the main Russian line; the marshy region of the Obra, in the province of Posen, and the large swampy forests, which however form no continuous line, but which spread at intervals between the Warthe and the Upper Vistula. The best natural protection is afforded by the nature of the soil, generally of deep sand and impassable for heavy vehicles except along the highways, which are comparatively few in number. Proper materials for road-making are scarce, so that though the principal highways are good the cross-country roads are hardly practicable in bad weather. (The student of military history will be reminded of the "boue de la Pologne" to which Napoleon was fond of attributing his want of decisive success in the early part of 1807.)

"Hence," as Captain Kirchhammer remarks, "certain communications

¹ Throughout this paper the distances are given in English miles.—L. G.

"have in this district an importance which, as a rule, only applies to roads
"in high mountain regions."

It is evident that fortifications will play a more than usually important part in the defence of a frontier of this nature. Before, however, enquiring into the work of the military engineer, let us see what the railway engineer has done to make the frontier on each side accessible, remembering that under the conditions of modern warfare a good system of railway communication is perhaps more essential to the defence of a State than a chain of fortresses.

Germany is, thanks to the foresight of her statesmen, very well off in this respect.

German Railway System.—In the north four main lines lead from the interior to the Vistula.

1. Berlin, Stettin, Dantzig.
2. Berlin, Küstrin, Dirschau.
3. Berlin, Küstrin, Bromberg.
4. Berlin, Frankfurt, Posen, Thorn.

A line connecting the terminus of these four main roads runs along the left bank of the Vistula and parallel to it from Dantzig to Thorn.

There are three railway bridges over the Vistula within German territory :

1. At Dirschau-Marienburg.
2. At Graudenz.
3. At Thorn.

Besides the connecting lines above-mentioned, there are many others more to the rear (three of which run to the sea coast) affording the most complete transverse communication between the great main roads.

Two of the latter cross the Vistula and are prolonged to the furthest extremities of East Prussia.

1. Dirschau, Marienburg, Elbing, Königsberg, Insterburg.
2. Thorn, Jablonowo, Deutsch Eylau, Korschen, Insterburg.

From Insterburg one branch runs to the northernmost German town, Memel, and two branches to the frontier at Eydtkuhnen and at Protsken.

Further back a transverse line from Königsberg crosses No. 2 East Prussian main line at Korschen, and also runs to Protsken ; another from Marienburg by Deutsch Eylau to the frontier at Jlowo, whilst a short branch connects the bridge at Graudenz with No. 2 main line at Deutsch Eylau.

The three lines which run to the frontier are there connected with Russian railroads.

The only line which actually runs to the frontier in the long stretch between Thorn and Myslowitz (about 250 miles) is that from Breslau to Wilhelmsbrück. Perhaps, as "ein deutscher Offizier" remarks, the construction of such lines is omitted lest the Russians should be tempted to make lines in prolongation through the railwayless district, opposite that part of the frontier where communications are much required for strategical purposes. At a short distance from Thorn the German lines unite with the Russian railroad which goes to Warsaw ; at and about Myslowitz with the Austrian line leading to Cracow and with another Russian line leading to Warsaw. There is direct railway communication between Thorn and Myslowitz, all along the frontier and at a distance of from 10 to 20 miles from it. This frontier railroad is connected with the main lines in rear by two lines from Posen (1. Posen-Gnesen ; 2. Posen-Jaroczin) ; by two from Breslau (1. Breslau-Kempen ; 2. Breslau-Kreuzburg) ; by one from Oppeln (Oppeln-Dossowski) ; and by several from Upper Silesia, where there is a perfect network of railways, due to the mines which abound in that district.

Again a line runs from Frankfurt by Glogau, Breslau, and Oppeln to the furthest extremity of Silesia, and another about 40 miles in rear, also from Frankfurt through Liegnitz, Neisse, and Ratibor. These lines unite Silesia with the heart of the Empire, and are joined together and with the frontier

line by numerous branches. There is communication also between Berlin and the rearmost of the lines just mentioned at three different points, without going through Frankfurt, namely, at Guben, at Sagan, and at Liegnitz.

Taking into consideration the inferiority of Germany to Russia at sea, an inferiority which is likely to continue for some time to come, the German Government has done wisely in providing its maritime frontier with as good railway communication as that given to the eastern frontier, for although the excessive shallowness of the water all along those shores is in itself a great protection against hostile descents, yet there are here and there certain vulnerable points, communication between which and the interior is necessary for military reasons. Hence a grand coast-line has by degrees been constructed right away from Schleswig to Memel, passing through Lübeck, Stralsund, Stettin, Dantzig, and Königsberg.

The section of this line from Stettin to Memel has already been mentioned as No. 1 main road leading to the Vistula and continued through East Prussia.

Such is the railway system of the eastern provinces of Germany; and thanks to the complete communication thus established within the provinces themselves, and between them and other parts of the Empire, it would be easy to subsist a large army within them without injury to the people, particularly as though the country is not fertile throughout, rich fields alternating with sterile tracts, it yet, on the whole, produces both in cereals and in cattle more than is required for its inhabitants. The railways in Eastern Germany are all State property, which is of course an advantage for military purposes.

All the lines are single except the following :—

Berlin, Küstrin, Königsberg to the frontier.

Berlin, Stettin.

Berlin, Frankfurt, Liegnitz, Breslau, Mysłowitz.

The gauge of the German railways is 4' 8½".

The principal bridges on the frontier lines are prepared for mines. A certain portion of the carriages are provided with shifting axles so as to be used on the Russian railways, the gauge of which (5') was made wider than that in use in Germany as a precaution against invasion.

The Fortifications on the German Frontier.—Let us now examine the fortifications of the German north-eastern frontier, commencing with Memel, the northernmost point. "The small strip of land which stretches northwards between the Russian frontier and the Kurisches Haff is separated from the rest of the province, not only by that piece of water, but also by the Memel (or Niemen) river, which forms an important military obstacle. In the northern part of this strip of land, and close to the mouth of the Kurisches Haff, is Memel, a town which has made great progress during the last few decades, and has now attained a position of considerable commercial importance. At the entrance into the Haff known as the 'Memeler Tief,' strong coast forts have been constructed answering all modern requirements; provision has also been made for laying torpedoes. Memel itself is unfortified, and as it would necessarily be left to itself it would probably be occupied by the enemy if the German Army were reduced to the defensive. Even the fortifications at the mouth of the Haff would be unable to withstand a combined attack from land and sea, but if vigorously defended they might hold out till a change had taken place in the general situation, and thus contribute to the expulsion of the enemy from the neighbouring district. Moreover, the importance of an occupation by the enemy of the 'Kurisches Haff' should not be exaggerated, this inland sea becoming, even near its mouth, so shallow that only gunboats of very light draught can penetrate to any distance."¹

¹ Ein deutscher Offizier.

South of the Kurisches Haff, about 90 miles from the frontier and on the Pregel, is Königsberg, which has been made into an entrenched camp of the first class, being surrounded by thirteen detached forts of the most modern construction and pushed well to the front. These works extend to the mouth of the Pregel, thus securing the navigation of the Frisches Haff, the entrance of which inland sea is guarded by the little fortress of Pillau, of itself of small importance, but sufficient in combination with some strong coast batteries, provided with Grusen cupolas and with a system of torpedoes, to fulfil its object.

Königsberg cannot be completely invested unless the assailant succeeds in forcing the entrance of the Frisches Haff, which, until this is done, would enable the defender to keep up his communication with Dantzic. Captain Kirchhammer considers the works of Memel, Pillau, and Königsberg, together with the two Haffs, and the rivers which run into them, as one vast fortress of which Königsberg is the key. He remarks that to complete it two forts should be constructed, one near Wehlau, commanding the Pregel and the Alle, and the other near Labiau, covering the Deime, the outlet of the Haff and the communication with Memel. "At all events," says "ein deutscher Offizier," "Königsberg would bring the invader to a standstill, unless he were strong enough to leave a corps behind to invest or besiege it, and could count upon effecting a junction on the Vistula with another army which had meanwhile been advancing along that river." He adds in a note, that a Russian siege of Königsberg would be facilitated by the fact that their principal engineer depôt is at Dünaburg on the Königsberg-Petersburg railway.

The southern portion of East Prussia, for about 120 miles, is well protected by the chains of lakes and marshy hollows which extend from near the Pregel to within 30 miles of the Vistula.¹ Good roads are very scarce in this region, for ever rendered famous by the campaigns of 1807, and the two principal highways through it are blocked by the works at Lötzen and Osterode, which also command railways.

Nature has done much to strengthen this part of the German frontier, leaving but little for the engineer to do.

We now come to Thorn, commanding the Vistula near its entry into German territory, a strategical point the extreme importance of which was at once recognized by the Prussians when it came into their possession in 1815, and has been much increased of late years since it became the point of junction of four great railways. Consequently the fortifications have latterly been much extended and strengthened, the enceinte having been enlarged and eight great detached forts being in course of construction; five on the right bank and three on the left bank of the Vistula: 5,280,000 thalers have been voted for these works, which are to be completed this year. Thorn will then be an entrenched camp with a double bridge-head, a formidable post both for offence and defence.

Northwards of Thorn, right away to the sea, a distance of about 100 miles, the Vistula forms a barrier over 100 yards wide between the detached eastern provinces and the body of the Empire, the Dantzic-Thorn Railway running parallel to the river and along its left bank. There are bridge-heads at Graudenz and at Marienburg, which serve to protect the railway bridges against a *coup de main*, but which are not capable of withstanding a serious attack. At the mouth of the Vistula is Dantzic, an important seaport with nearly 100,000 inhabitants, communicating with Königsberg and Pillau by the Frisches Haff, and for that reason as well as on account of its situation in a low tract of country, easily inundated and cut up by numerous watercourses, very difficult to invest.

¹ It should be remembered, however, that the winter is very severe throughout the whole of the region under notice, and that the lakes and most of the rivers and water-courses are frozen hard in that season, ceasing then to be military obstacles.—L. G.

It was taken by the French in 1807, and from them in 1813, after a six months' blockade, followed by two months' open trenches. Its fortifications have been much strengthened in modern times, and it is now a strong fortress.

South-west of Thorn, and at the distance of about 80 miles, is Posen, the capital of Prussian Poland (50,000 inhabitants), opposite the most salient point of the Russian frontier, and about 40 miles from it. Here unite six lines of railway.

1. The great main line from Berlin.
2. From Stettin.
3. From Colberg.
4. From Thorn.
5. From Breslau.
6. From Myslowitz.

As a great junction point of railways, as a wealthy town, as centre of a district rich in resources, and as being almost the middle point of a line drawn from Dantzic to the extremity of Silesia, the position of Posen is of great strategical importance, and the engineer's art has done much to increase its value.

"Ein deutscher Offizier" says, "When the fortress of Posen was first commenced in 1830, the intention was to construct a citadel (Fort Winiary), and some other separate works simply for the purpose of keeping down the population of the provincial capital in case of a Polish insurrection. It was only ten years later that the idea of also providing against a foreign foe was conceived and acted upon by making a strong enceinte with a couple of detached forts a little in advance of it. When the introduction of rifled artillery came to modify the principles of fortification, the old defences were no longer deemed sufficient, and it was determined a few years ago to surround the place with a wide girdle of strong detached forts, which are now approaching completion, and thanks to which Posen will become a place of arms of the first class."

According to Captain Kirchhammer there are eleven detached forts, the whole of which should be completed this year, 7,023,000 thalers having been voted for this purpose in 1873.

Sixty miles south-west of Posen is Glogau (18,000 inhabitants), a town of considerable military importance on account of its position on the Oder, and as being the point of junction of four railways :—

1. From Coburg.
2. From Frankfurt.
3. From Posen.
4. From Breslau.

The old fortifications, dating from the time of Frederick the Great, have latterly been extended and strengthened, so that Glogau is now quite a defensible bridge-head. It is of the more importance because, between it and the extremity of Silesia, the right flank of the German eastern frontier, that is to say, for a distance of 170 miles, there is no fortress which would be of any value in case of a Russo-German war, for Neisse and Glatz would be out of the sphere of operations. It has often been proposed to fortify Breslau, but as yet nothing has been done, and Breslau remains an open town.

We have now to notice Küstrin (9,000 inhabitants), "On the line Berlin-Posen, situated very favourably at the junction of the Warthe and the Oder. Both streams flow through a wide marshy bottom, the passage of which, except at the bridges under fire of the fortress, is extremely difficult, so that it is not easy to invest the place. The knowledge of the importance of Küstrin in covering Berlin against an attack from the east led to many additions being made to the fortifications from the very commencement of the railway works, but these additions hardly rise to the requirements of modern

"science. On that account, and because the idea of fortifying Stettin was given up, it was determined by constructing several detached forts pushed well in advance, so as to secure the power of debouching on all three sections of the circuit formed by the two rivers, to make of Küstrin an important place of arms which would much impede the advance of an enemy pushing on from Posen along the Warthe."¹ There are six detached forts, for which 4,731,000 thalers were voted. Küstrin is only 50 miles from Berlin.

The Russian Frontier.—The old Kingdom of Poland forms the whole of that mighty wedge which, as before stated, plunges into the heart of Germany, being bounded on the north by the provinces of East and West Prussia, on the south by the Austrian province of Galicia, whilst it is faced to the west by Posen and Silesia. "Surface, a vast plain with a mean elevation of 300 to 500 feet above the Baltic, except in the south, where offsets of the Carpathian Mountains rise to 1,000 feet. It is well watered and covered with extensive forests. Chief rivers, the Narew, Niemen, Vistula, Bug, and Warthe. There are many small lakes and marshes in the north-eastern districts. Climate, extreme. Summer, very hot. Mean temperature, 90°. Winter, very cold. Temperature falls to 10° below zero. The country is snow-clad and frozen for five months in the year. Soil, sandy loam resting mostly on granite. Generally fertile."²

One remarkable peculiarity of the position of Russian Poland is that it is an advanced post in a great measure detached from the rest of the Empire, being separated from it by the great marshes of Pinsk, which cover a large portion of the district between the Bug and the Beresina, reducing the width of land available for communication between the two portions of the Czar's dominions by at least one-half. The Vistula is the first natural obstacle of any importance which an invading army coming from the west would encounter, and it is along the middle part of that river's course and on the banks of its tributaries that the Russians have concentrated their chief means of defence, as we shall presently see.

Russian Railways.—There are only three railways communicating between the line of the Vistula and the interior.

1. Petersburg, Dünauburg, Wilna, Bialystok, Warsaw.
2. Moscow, Smolensk, Minsk, Brest-Litowski, Warsaw.
3. Odessa, } Kowel. Brest-Litowski, } Warsaw.
Kiew, } Iwangerod.

No. 1 line has branches—

a. From Dünauburg to Schab, which is to be continued to Tilsit, in East Prussia.

b. From Wilna to join the Königsberg-Wirballen line.

c. Bialystok to the Königsberg-Prottsken line.

d. Warsaw to Jlowo (West Prussia).

Nos. 1 and 2 main lines are also connected between—

Dünauburg and Smolensk.

Wilna and Minsk.

Bialystok and Brest-Litowski.

The former two connecting lines extend to meet the South Russian railway system. All the main lines from the interior unite, as we have shown, at Warsaw. Only one line from thence crosses the Vistula, soon, however, dividing into two branches, one of which runs down the left bank of the river to Alexandrowo, near Thorn, where it joins the direct line from Berlin, whilst the other runs to Königshütte, in Silesia, and to Gravica, in Galicia, where it meets the German and Austrian lines respectively. The whole intervening space between the termini of the two branches (from point to point, about 150 miles), is absolutely without a railroad. However, says "ein deutscher Offizier," "The

¹ Ein deutscher Offizier.

² From Johnstone's "Gazetteer."

"energy with regard to railway construction which has been developed of late years in Russia will soon alter this state of things. Several new projects have recently received the approval of Government, and steps have already been taken, in some cases, for the actual construction, in others for the preliminary surveys. As far as we can learn from the newspapers, it is intended to make lines to the central portion of the Russo-German frontier; namely, from Kutno, on the Warsaw-Alexandrowo line, by Kolo to Slupice in the direction of Posen along the right bank of the Warthe, and from Lodz, which is on a short branch from the Warsaw-Königshütte line, westwards to Kalisch on one side, and on the other by Sieradz to Wilhelmsbrück, where it will join the German line from Breslau. Again, if other projects are carried out, the Russian railway system will be united with that of Austria, a line being contemplated along the left bank of the upper Vistula from Ivangorod to Cracow, and another from Sandomirz to Koluszki on the Warsaw-Königshütte line. A branch is also spoken of on the right bank of the lower Vistula to Rosenberg, in East Prussia. All these additions, however, will be of little effect from a military point of view upon the utility of the railways west of the Vistula, as long as the passage of this river, hence the connection of the railways on its left bank with those from the interior of Russia, is only to be effected by the one bridge at Warsaw. It will be absolutely necessary to build several railway bridges over the river before you can calculate upon concentrating a Russian army on the central and southern portions of the German frontier with the speed demanded by the present style of making war.

"It is deserving of mention, too, that very few of the Russian railways belong to the State; they are in the hands of about fifty private companies, which are, however, in many cases indebted for subventions or for guarantees of dividend to the Government, which has thus gained a certain influence over the management, a fact of importance with reference to the employment of the lines and of the rolling stock for great movements of troops. The Russian Government attains the same end also by encouraging the fusion of companies whose lines are in connection. We believe that the West Russian, and quite lately also the south-western companies, are fused."

All railways from the interior of Russia to the Polish frontier have only one line of rails. The Russians adopted for defensive reasons a measure of very doubtful expediency, to which we have already alluded, namely, that of a wider gauge (5'), for their railways than that habitual on the continent of Europe (4' 8½"). A portion of their carriages, as in Germany, are fitted with shifting axles.

Russian Fortifications.—"If," says "ein deutscher Offizier," "we now make a closer examination of Russian preparations for defence against Germany, and if we survey in the first instance the system of fortifications in what was formerly the Kingdom of Poland, we find the tactical centre of this system to be Warsaw, the capital.

"The town itself, situated on the left bank of the Vistula, is not fortified, but is commanded by the strong and spacious citadel, Fort Alexander, which bounds the town to the north, and was originally intended rather to control the native population than to oppose a foreign enemy. The citadel is supported on the left bank of the river by a number of small detached forts (six), pushed forward a few hundred yards, and well calculated to assist in the defence of the capital in combination with the troops which would probably be concentrated about it, and with field works thrown up on the spur of the moment.¹

¹ The author states in a note that information from native sources about Russian fortifications being very meagre, he has made great use of an article which appeared, in 1877, in "La Rivista Militare Italiana," on "Le piazze forti della Russia."

"The position, however, does not lend itself to effective offensive operations with large masses on the left bank. Two bridges span the Vistula within the fortifications, one communicating between different parts of the town, the other, a railway bridge, between the town and citadel; a small fort on the right bank covering the latter bridge. The neighbouring fortifications of Praga, the suburb of Warsaw, on the right bank, appear to have lost their former importance owing to the manner in which the surrounding ground has been built upon since their construction.

"About 22 miles from the Vistula and at its junction with the Narew, the fortress of Modlin, or according to modern nomenclature Novo-Georgiewsk, forms the strong advanced right flank of the Vistula position. The construction of the existing fortifications of this place was commenced between 1830 and 1840, and may be looked upon as the Russian answer to the Prussian works at Posen. In the fortifications of Novo-Georgiewsk, as in nearly all the more modern Russian works, we remark the same principles of construction as in the so-called new Prussian system, which was so much in favour in Prussia under direction of General Bressa in the period between 1830 and 1850, and which reached its most complete development in the enceintes of Posen and of Königsberg.

"The introduction of rifled guns has, as is well known, seriously shaken this system, and has led to very material modification of its principles. The weakness of the works in question in face of rifled guns can hardly be unknown to Russian engineers; but though we have heard constantly of small additions being made to their strength, and though some years ago a widely extended chain of detached works around the place was projected, we yet know nothing of the execution of this plan nor of any really decisive steps being taken to remedy defects, and first and foremost to shelter the numerous and extensive constructions in masonry from indirect artillery fire; a German army would therefore probably find this extremely important place still in much the same condition as, for instance, was Posen before the commencement of the works now in progress at that place, and quite unfit to offer a prolonged resistance against heavy rifled artillery.

"It seems peculiarly fitting to make this remark (which applies more or less to all Russian fortresses) with reference to Novo-Georgiewsk, the said fortress having been entirely reconstructed, and being thus the best sample of the latest development of military engineering in Russia. The important town of Modlin stands on the right bank of the Vistula and of the Narew, is surrounded by a strong enceinte, and has a citadel. A bridge-head has been constructed on the left bank of each river, but so close to them as to be unable in any way to facilitate offensive operations on a large scale. Eastwards of Novo-Georgiewsk the Narew covers for about 20 miles the right flank of the Russian position on the Vistula, being then relieved in this duty by the Bug, at whose junction with the Narew is the little town of Sierock, the fortification of which has been repeatedly, and even as lately as 1876, recommended by the Russian engineer-department. The construction of a fortress such as proposed would doubtless contribute greatly to the security of the right flank of the Vistula position, but as yet we do not know that anything has been done in the matter. The fortress of Ivangorod (formerly called Demblin) forms the left flank of the position on the Vistula, about 56 miles above Warsaw, at the junction of the Wieprz with the Vistula.

"The little town stands on the right bank of the latter river and is surrounded by a bastioned enceinte, the only advanced works up to this

He adds that though he has taken great pains to verify the accuracy of the Italian writer, and to add to the details given by him, he must admit that he has not always been able to learn as much as he could wish upon the subject.—L. G.

"time being three earthwork lunettes at a few hundred yards from the body of the place. According to the newspapers, however, an enlargement of the fortifications is actually in progress which would result in the construction on the right bank of the Vistula of four detached forts nearly a mile in advance, and on the left bank of two other forts forming a bridge-head for offensive purposes.¹

"With the exception of the last named works, which may be employed quite as much against Austria as against Germany, we cannot look upon the engineering arrangements for strengthening the naturally strong position on the Vistula as very imposing.

"Although the importance of the fortifications would doubtless be increased by the presence of a strong Russian army between the Vistula and the Bug, yet we cannot think that a German army provided with a proper siege train would find it very difficult to ruin the works of Novo-Georgiewsk and of Warsaw, thus leaving no advantage to the Russian defenders except that arising from the natural strength of their position. In rear of the centre of the Vistula position, and serving to a certain extent as its reduct, is the fortress of Brest-Litowski. This place, situated at the point where the Moscow-Warsaw railroad crosses the Bug, seems, together with the fortress of Kiew, which we shall notice further on, to be considered by Russian engineer officers as of particular value for the defence of the country, and considerable additions to its fortifications appear to have been ordered at various times down to the latest date. The unimportant town of Brest-Litowski is on the right bank of the Bug near its confluence with the Muchaviec; its fortifications apparently on the new Prussian system extend along both banks of the two rivers, and have been strengthened by four detached advanced forts, constructed with a view to the offensive on the left bank of the Bug. A strong fortified barrack has been erected on an island within the place and serves as a central reduct.

"The strength of Brest-Litowski depends principally upon its position near the western branches of the Rokitno marshes,² which extend eastward to the Dnjepr, and by their further extension on both sides of the Pripiet, as well as by their impracticability for every description of military operations, completely separate the northern part of Western Russia bordering on Poland from the southern part thereof which borders on Austria and Roumania. If a German invader after occupying Poland were even to limit his further operations to the region north of the Rokitno marshes, he still would be unable to confine himself to a mere investment or observation of Brest-Litowski; he must needs take it, so that during the subsequent operations his right flank and his communications may be secure from Russian attempts which may be expected from the south.

"A railway connects Brest-Litowski with Kiew and the south-east, thus placing the country along the upper and middle Bug in communication with the richest and most populous parts of Southern Russia, and opening out a store of valuable resources, for the space between the south-western portion of the Rokitno marshes and the Galician frontier is sufficient for the movement of large bodies of troops which would be further facilitated by the existence of several considerable towns in those parts. The importance of this circumstance for active defence has not been unnoticed by the Russian Government, and the Commission for considering the strategical condition of

¹ Captain Kirchhammer speaks of nine forts placed in a circle round the confluence of the two rivers, at a distance of from 2,000 to 5,000 paces from the old fortress, forming a "double offensive bridge-head." The *Golos* of November 7, 1879, quotes from the "Lüblin Gazette," which states that the works at Ivangorod are being carried out with the greatest vigour. The earthworks were already finished, and the contractors were proceeding with the brickwork.—L. G.

² Otherwise called Pinsk marshes, said to be the largest in Europe.—L. G.

"the frontier is reported to have recommended, as far back as 1874, the establishment in this locality of a great place of arms, and with that view either to rebuild, according to modern ideas, Luzk (Michaelogorod), the works of which are of an obsolete pattern, or to refortify Dubno. According to report the Government has determined to make both places into strong fortresses, and it is said that the necessary works have already been commenced. Although these precautions may seem to be directed more especially against Austria, they yet at the same time provide an excellent base for offensive action along the Bug and Vistula, and supposing a German army to be occupying Poland, it can only secure itself from molestation from the south either by another army being placed to block out Dubno and Luzk, thus extending inconveniently the sphere of operations, or, as we said before, by taking possession of Brest-Litowski. This place therefore fully deserves the high esteem in which it is held by Russian engineers.

"You may go to a long distance from the eastern border of Poland into Russia before meeting with any defensive works. The district, too, north of the Rokitno marshes, although traversed here and there by watercourses running through depressions which are in places swampy, presents no insurmountable natural obstacle to military operations.

"The old fortress of Dünamünde stands at the point where the Warsaw-Petersburg road and railroad cross the Dwina, and on the right bank of that river; the town, which is small, is surrounded by a complete enceinte, with several advanced works, whilst on the left bank is a tolerably strong bridge-head formed by a combination of several forts. The defensibility of this place is much augmented by the marshy nature of the surrounding country, but we have not yet heard that the old works have been remodelled, as they should be, to meet modern requirements. We have already noticed the importance of Dünamünde as a principal engineer dépôt.

"The little fortress of Dünamünde, at the mouth of the Dwina, in the bay of Riga, only serves to protect the harbour of Riga against maritime attack, and may therefore be left out of consideration.

"The next fortress in the district under notice is Bobruisk, about 220 miles south of Dünamünde, and on the right bank of the Beresina, which here joins the Dnjepr. It has a complete enceinte, with a few detached works in advance. The left bank of the river appears to be unfortified, but being commanded by the works on the right bank, it is sufficiently guarded by them for mere passive defence. Bobruisk covers the old high road from Warsaw to Moscow as well as several other important communications which here unite to cross the Beresina, but the Warsaw-Moscow railway is carried over the river at Minsk, 100 miles more to the north. The importance of this fortress in the event of a Russo-German war is much diminished, by this fact, and the place is the less likely to be visited by a German invading army, because branches of the Rokitno marsh pervade the whole basin of the Beresina, rendering the region unfit for military movements."

About 170 miles further south is Kiew, on the Dnjepr, which it is hardly necessary to mention with reference to war between Russia and Germany, being quite out of the field of operations, but it is a place of great importance, and it appears that a considerable proportion of the funds at the disposal of the engineer department has of late years been expended on it. Moreover, this is not all. The old fortress of Chotin, on the Dnjestr, has been much strengthened within the last ten years, and has been united to Kaminiac-Podolski by a series of detached works so as to form a large entrenched camp.

Having now given a slight sketch of the country on both sides of the Russo-German frontier with reference both to natural and artificial means of defence, let us see what the Officers from whose treatises we have already so

largely borrowed, think of the chances of a war of invasion undertaken by either Power.

Invasion of Germany by Russia ("Ein deutscher Offizier").—Taking Berlin as objective, "We have to consider four main lines of advance for an invading Russian army. It may either move westward from Wilna, on the valley of the Pregel and Königsberg; from Warsaw either in a north-west direction along the Vistula; or west along the Warthe against Posen; or, lastly, south-west against Silesia. The first two lines of advance are favoured by the existing Russian railway system, and afford the opportunity of combining land operations with those of a fleet which will, we may suppose, be conducted at the same time. By pushing forward along the Vistula, the invader would not only gain the advantage of using this stream as an important channel of communication, he might also, if the movement were the main operation and successful, cut off the extensive province of East Prussia with its resources from the other German territories, and join hands with an auxiliary force advancing at the same time along the Pregel. Such being the case, these two lines would appear to be the most favourable for a Russian invasion, and the military resources of Russia would appear equal to the task of taking the offensive in both directions at the same time. We are led to conclude, at all events, that our authorities entertain that opinion, from the fact that in the German preparations for defence it is just this north-eastern portion of the frontier which seems to have been particularly considered.

"A movement from Warsaw westward on Posen would be very tempting to a Russian invader, from the fact that it would lead him by the most direct route on Berlin; but if this line of advance were selected, the invader would have to give up all railway communication with his base and would expose himself to the danger of being taken in rear by diversions either from East Prussia or from Silesia. It seems improbable, therefore, that the Russians will choose this line of operations at least until the before-mentioned railways from Kutno and Lodz to the frontier have been completed.

"Lastly, if they select the line of advance from Warsaw on Silesia they are bound by the existing system of railways to take the direction of Upper Silesia, somewhere about Oppeln; the invading army would there find itself in a country not very well suited to operations on a large scale, and in a district far removed from the main objective; it would, moreover, be exposed to extreme risk of attack from the north-eastern provinces along the Vistula. An invasion in this direction can only be considered probable if Russia were able to count upon assistance from Austria, and wished to act in combination with that Power.

"Such a possibility may, however, be dismissed from our thoughts. The present friendship between Germany and Austria is not merely of a temporary nature, but will, as far as we can foresee, be permanent, based as it is on a just appreciation by each nation of the interests common to both. The principal interests of Austria centre on the Lower Danube, which forms the main artery of the Empire. Here she comes into conflict with Russia, whose struggles for expansion are necessarily in that direction and towards the Black Sea. The interests of the two nations in those parts are difficult to reconcile, and they will continue to be rivals for many generations, the natural tension being increased by the Pan Slavist idea which crops up periodically threatening when it does so to disturb a part of Austrian territory.

"Germany also has an interest not only in the development of Austrian influence on the Lower Danube, but also in maintaining the might of the Empire-State in face of the insecure condition of affairs in the Balkan peninsula; it is therefore the natural ally of Austria eastwards, and the two States are more likely to be on the same side than opposed to one another in case of a war in the East."

We have already, when describing the fortifications which defend the provinces of East and West Prussia, alluded to the difficulties which would impede the direct advance of a Russian army through those countries; let us now see what obstacles a force proceeding from Warsaw down the Vistula would have to encounter.

¹ "A passage of the German frontier by an army following the course of the Vistula along the right bank would not be greatly hindered by the Drewenz, which there forms the boundary, but the close investment or capture of Thorn would be necessary to the success of the movement.

"A further advance northwards along the right bank of the river would then meet with no difficulties, particularly if undertaken in connection with an army operating on the banks of the Pregel. Graudenz is, as we know, no longer of any account as a fortress.

"Its position, as also that of Marienburg, is such that neither fortress has any offensive power, that is to say, they would be of no use in facilitating offensive action on the part of the Germans from the left bank against an enemy in force on the other.

"Although there would be no longer any material obstacles in the way of a hostile occupation of the district on the right of the Vistula, still the enemy would hardly think of crossing the river and of pursuing his operations on the left bank until one at least of the fortresses, Königsberg or Thorn, had fallen into his hands.

"The construction and armament, however, of these strongholds give us good grounds for supposing that if, as may be expected, well and energetically defended they would hold out a long while, and thus give the German commanders time to perfect their defensive measures. If, however, a Russian invader succeeded in crossing the Lower Vistula, he must next take pains to secure, by means of fortifications, the passage over the river, which here forms a considerable military obstacle, and then to render Dantzig innocuous, threatening, as it would, his right flank."

"The enemy would, therefore, after crossing the Lower Vistula encounter difficulties only to be overcome by an expenditure of time which would benefit the German defence. Under these circumstances the invader would do well to consider whether it would not be more judicious to advance from the first on the left bank of the Vistula, the occupation of which close to the frontier would at once be rendered necessary for the purpose of investing Thorn; there, however, he would come at once upon an awkward wooded country, much intersected by swampy bottoms between the Vistula and the valley of the Netze, westwards of the former river, rather an inhospitable region, and further on the defiles formed near Bromberg by the low swampy land between the Netze and the Brahe, that is to say, he would get into a situation not particularly favourable to a large invading army. If he advanced in that direction, too, he would find it very difficult to keep up his communication with the other corps, which we may suppose to be advancing from the east on the Vistula. We may leave entirely out of the question the idea of dividing the invading army on the Vistula and of advancing at the same time along both banks, as to adopt such a course would be to attribute much too great a degree of weakness and indecision to the German leaders.

"In case of a movement westwards from Warsaw on Posen the field of operations would be divided by the Warthe, and particularly by the wide lowlands along its course within Russian territory. North of the Warthe, as far as the Netze, on the frontier of Posen, there is a remarkable water system consisting of a chain of small lakes, which extend from north to

¹ Ein deutscher Offizier.

"south, and are generally united to one another by little patches of swamp. This chain of numerous lakes, which cover the whole district, stands in the way of a Russian invading force and renders the north-east part of Posen much more favourable to defence than to attack. An invader, after investing Thorn, situated only a few marches from the Warthe, and after overcoming all the natural difficulties which here stand in his way, would very soon come upon the fortress of Posen and be brought to a standstill.

"A Russian army advancing on the left bank of the Warthe, where the Prosna, which here forms the boundary, is no serious obstacle, would certainly have to deal with fewer difficulties of ground, but would be diverted in its onward march by the great Obra marsh lying in front of it either on one side to within reach of the fortress of Posen, or on the other side to within reach of Glogau upon the Oder."

"According to the direction taken by the invading army, either northwards on the Warthe or southwards on Glogau, it would have to invest or take either Posen or Glogau. The latter undertaking would doubtless be the easier of the two, and it would, moreover, give the invader some further advantages.

"By taking the direction of Glogau, with his right flank covered by the Obra marshes, he would find no difficulty in penetrating to the left into the fertile district of Middle Silesia, in occupying the open town of Breslau, and in making sure thus of a quantity of valuable resources; it would be much easier to cross the Oder at Glogau than further down, where the valley of that river expands into a broad bottom very difficult to get over; and, moreover, by taking this route the invader would be able to turn Küstrin and to advance in a north-western direction on Berlin."

"The want of railway connection between the Warsaw-Vienna line and the German frontier would make it very difficult for the invader to keep up his communication with his base; and as long as Warsaw remains the only point where the Vistula can be crossed, would expose him to be completely severed from it by a bold German counter-stroke made from Thorn along the left bank of the river.

"The proposed Russian branches from Lodz to Kalisch and to Wilhelmsbrück would only partially remove this objection, which would, however, entirely cease to hold good if new lines were carried over the river above Warsaw from somewhere about Ivangorod and Sandomirz so as to connect securely the railway system in the interior of Russia with the lines leading to the Prussian frontier. This is clearly only a question of time, and to provide for a state of things which would considerably alter the defensive properties of the German frontier it would be well to take into consideration the expediency of renewing the project so often suggested, but never carried out, of fortifying Breslau, and of making this important provincial capital into a place of arms which an invader advancing in the direction supposed could not afford to leave behind him. Lastly, we must notice the possible, but by no means probable, invasion of Upper Silesia, making use of the Warsaw line as far as Czentochau. The enemy would have first of all to encounter the extensive and somewhat impracticable wooded district on both sides of the Malapane and on the right bank of the Oder before reaching the fertile fields of Middle Silesia."

"He would encounter no material obstacle in the way of his occupation of this district and of Breslau, and would indeed meet with no impediment till reaching Glogau. Although the conversion of Breslau into a stronghold would be of great value in the event of an invasion such as suggested, at the same time we must not forget that, were the Russians to take the

"offensive in this direction, the operation would be so eccentric that it would hardly be suitable for the main army.

"From all these considerations we are, it is thought, justified in concluding that under present circumstances the German frontier provinces are sufficiently secured against Russia, partly by their natural conformation, and partly by the art of the engineer. The dispositions made by the latter, except with regard to the forts for mere local defence among the East Prussian lakes, testify to the fact that the Germans do not contemplate the idea of a mere passive defence of the frontier by directly barring its numerous approaches, which would indeed be impossible in consequence of its great extent. If a different course has been pursued with regard to the East Prussian coast, the difference is explained by the fact that it is only accessible at a few points which are not difficult to fortify; further on along the Pomeranian, Mecklenburg, and Holstein shores the more important harbours of Swinemünde and Kiel are the only places strongly fortified, whilst at Kolberg and at Stralsund (in consequence of its connection with the island of Rügen) some of the old works for the immediate protection of these ports were preserved. As regards the rest of the coast it will be defended by movable columns, the operations of which are facilitated by the construction of the complete system of railways already described. We may consider the defence of the territory along the land portion of the frontier as provided for in a similar manner.

"The troops being mobilized in good time, and concentrated at certain important points, may be transported by means of the well arranged German railway system to any point where their presence may seem to be required, and where they may at once take that bold and active offensive so suitable to the German character. Should the enemy get the best of the first encounters, the large places of arms situated on the most probable lines of invasion will give the defeated army the opportunity of taking temporary shelter from the superior force of the invader (who will be obliged to secure himself against these strongholds). It will then bide its time until a favourable opportunity offers for resuming the offensive. At all events, these places of arms, thanks to their own power of resistance and to their situation, commanding as they do important sections of the frontier, will detain an invading force in the border districts long enough to enable the German War Department to collect and prepare for further resistance the considerable forces still remaining available for defence after the first mobilization has proved insufficient."

The German Officer now proceeds to discuss the chances of a German invasion of Russia as follows:—

"*German Invasion of Russia.*—If the object of invading an enemy's country consists in taking possession of as large a portion of the same as possible, so as to deprive the defender of its resources, thereby weakening him and disposing him to concession, it must be admitted that such a plan applied against Russia would not of itself be sufficient. The Russian Empire is of such vast extent that a hostile occupation must needs be confined to a proportionally insignificant part of it, and must be seriously inconvenienced by the numerous and considerable watercourses, by the large and almost impenetrable stretches of marsh and of forest imperfectly supplied with roads, and by the small number and poverty of the inhabitants. The defensive power of Russia depends principally upon these circumstances; an invader must, unless he would meet with the fate of Napoleon in 1812, confine himself to attacking Russia at her most accessible and vulnerable points, where he may strike such blows as will tell upon her power. The Western Powers pursued this course in 1854-55, and Germany would have to act in a similar manner if she took the offensive. One of the most vulnerable points in the north-western provinces of Russia bordering on Germany

"is certainly St. Petersburg, and an attack upon that political and administrative centre would be likely to affect the general result of the war. But the Russian capital is over 500 miles from the frontier; an invading force starting from East Prussia and moving upon it would not only have to cross some considerable streams, and also to traverse defiles through broad tracts of swamp, thus encountering difficulties of various kinds, but it must also extend laterally to an inconvenient distance so as to cover its communications.

"On the left, the side of the coast, the Russian fleet, which would completely command the sea, and which would have access to the numerous good harbours, would menace it and would have to be guarded against, whilst on the right whole armies would be required to give security, forces sufficient to hold their own against the Russian field armies which would probably not retire on St. Petersburg, protected as it is to a great extent by its distance and by natural obstacles, but rather to a flank into the interior of the vast Empire, receiving on its way the numerous reinforcements which would by degrees be assembled.

"And, moreover, should such a plan of invasion be carried out, it would be impossible to hinder the Russians from concentrating imposing forces in Poland, and from thence falling upon the Prussian provinces, whilst the remainder of the host opposed a stubborn passive resistance to the invaders."

"Germany must, whilst standing on the defensive, on the eastern frontier of East Prussia at once take possession of such a large portion of Poland as to cripple the action of Russia on that side. The Kingdom of Poland is the most densely populated portion of the Russian Empire, and is well adapted from the nature of the country for operations on a large scale; the task therefore which would devolve upon a German commander would not be impossible, and its successful completion, entailing as it would a prolonged occupation of the conquered country, might well lead to the attainment of the object of the war. Otherwise it would remain for the German leader to proceed with his further operations according to circumstances, his chances of success being much increased in every way by the preliminary occupation of Poland."

It remains for us now to quote Captain Kirchhammer's views on the prospect of a German or Russian invasion.

After describing the Russian railway system in the western provinces of the Empire, he proceeds as follows:—

"*Russian Invasion of Germany* (Captain Kirchhammer).—The value of these communications as a whole is much weakened by the fact that the two northernmost lines are much exposed in consequence of their situation in close vicinity to the German frontier. The Russian base is certainly not well adapted to military requirements. First of all it is too narrow in proportion to the extent of the German theatre of war; moreover, it is outflanked from the very first; in a word, it is weak. It does not ensure sufficient freedom of movement to a Russian army taking the offensive. With the exception of Czentochau, indeed, its points of *appui* are all defensible positions, but at present only two of these points, Novo-Georgiewsk and Brest-Litowski, are fortresses of real value. Moreover, the base of a Russian invading army would be 'en l'air.' Its right flank would be menaced in the most serious manner from the province of East Prussia, whilst its left would lean on Austria, which from Galicia commands the valley of the Vistula as far as Ivangorod. The friendship, or at any rate the neutrality, of Austria would be, from a military point of view, of the greatest value to Russia in case of a war with Germany.

"A Russian army taking the offensive by the principal line of operations,

"Warsaw, Posen, Berlin, would have on its flank and rear, after passing the frontier, the provinces of Prussia strategically so menacing. Any movement directed from those provinces on the right bank of the Vistula would exert an immediate influence upon the railway communications which are so important, and we may well say indispensable, between Poland and Russia.

"This consideration would oblige the Russian Commander to divide his forces. He would be compelled to operate with a second army against East Prussia, the defensive properties of which have been already pointed out.

"The series of lakes in that province, the marshy country in advance of them about the upper tributaries of the Narew, the line of the Pregel, and of the lower Vistula, the sea coast which does not offer a single point suitable for the disembarkation of large forces, the strong places of Königsberg, Boyen (Lötzén),¹ Dantzig, Graudenz, Thorn; when we view all these defensive elements as a whole, how many points of vantage do they not offer for the defender? What force of attraction to Russian attack, what power of resistance against it?

"Prussian Silesia, on the other hand, appears to be the part of the German frontier the least protected either by nature or by art.

"The rich town of Breslau is completely open. This province is also contiguous to Russian Poland, so that an insurrection in that country can be easily supported by sympathisers from Silesia. Taking count of these circumstances, and of the difficulties which a Russian invader would meet with to the north of the principal line of operations, we may assume that the Commander would be strongly tempted to enlarge his base, if necessary, by operating in Silesia. But can this be attempted without first being master of Posen and of Prussia? The German General could hardly defend Silesia better than by concentrating his forces in the commanding positions of Posen and of Prussia, whence, under shelter of the strong natural and artificial defences, he would turn to their confusion any eccentric operations of the enemy. If we now glance at the country in rear of the border zone, we find to the east of Berlin two watercourses, which are of great strategical importance, the "Netze" and the "Oder." The Netze, running from west to east, forms, thanks to the swampy nature of its banks, and also to its volume of water (it is navigated by steamers as high as Üscz), a strong line of defence, which gains a special value from its connection with the Vistula by means of a canal, and by the fact that the Bromberg-Küstrin railway runs along its right bank for about 150 miles. The Oder, which below Breslau has a width of from 170 to 280 yards, forms an important line of demarcation, and a good perpendicular line of defence. Besides the permanent bridges at Breslau, Glogau, Frankfurt, Küstrin, Schwedt, and Stettin, there are also some flying bridges over it, but, except where bridged, there are few places at which it can be crossed. The line of the Oder is defended by the fortresses of Kosel, Gross-Glogau, Küstrin, and by the Fort of Prussia at Stettin. Each of the places here named communicate with the interior by several railways, and with one another by lines which are on the left bank of the river, and thus sheltered from attack. It appears from the foregoing considerations, that if Russia assumed the offensive against Germany it would be compelled from the very first to extend its base of operations.

"*German Invasion of Russia.*—The same obligation to a yet greater degree would be incumbent on Germany were that Power to attack Russia. The adoption of a plan of invasion which would admit of methodical extension becomes in this latter case an absolute necessity. A German army would be unable to penetrate into the interior of Russia without being in the

¹ The fort at Lötzén, commanding one of the narrow passages between the East Prussian lakes; that traversed by the railway from Königsberg to Prottsen, is called Fort Boyen, from the Prussian Minister of War who planned the system of defence for East Prussia.—L. G.

“ first instance mistress of the basin of the Vistula within Russian Poland ;
 “ and the fact that the occupation of this province must be the first great
 “ act of a German invasion explains the important part which Poland plays in
 “ the defensive system of the Empire of the Czar. Considered with reference
 “ to military geography, the theatre of war on the middle Vistula, forming
 “ almost a regular quadrilateral, with sides of about 200 miles in length, is
 “ complete in itself. Shut in to the north and west by Germany, and to the
 “ south by Austria, it is directly separated from the interior of Russia by
 “ the marshes of Pinsk. Moreover, this separation is not merely geographical,
 “ Poland is also severed politically from the main body of the Empire. It
 “ may be looked upon as always ready to reinforce an invader.

“ If we seek for a line of defence behind which the Russians can establish
 “ themselves, and circulate with freedom, we remark at once the prominent
 “ importance of the Vistula, the Bug, the Narew, the Dniepr, and of the
 “ canals which unite these rivers with the Niemen and the Pripet. The triangle
 “ Sierack, Novo-Georgiewsk, Warsaw, must be looked upon as the most
 “ decisive position, as that in fact which, according to Napoleon, commands
 “ the whole of Poland. Its importance comes from the fact that the most
 “ considerable streams in this country form their junction within its precincts.
 “ This circumstance gives a Russian army the power of transferring itself,
 “ whether engaged in offensive or defensive operations, from one zone to
 “ another, and even of avoiding the enemy's attack, as often and for as long
 “ a time as may be necessary. The natural strength of this position has been
 “ further increased of late years by the development which has been given to
 “ its system of communications, and by the construction of permanent fortifica-
 “ tions. Thus the fortresses of Novo-Georgiewsk and of Ivangorod give the
 “ *appui* to the flanks of the line of the Vistula, in which it was before
 “ deficient, whilst at the same time considerably increasing the importance of
 “ the lines of the Bug, Narew, and Dniepr. The fortress of Brest-Litowski
 “ is an important complement to the defensive system on the Vistula, which
 “ fact was recognized by those who for merely strategical reasons traced the
 “ lines—

“ Mohilew-Minsk	} Brest-Litowski.
“ Kiev-Dubno	

“ This fortress is intended to cover the fractions of the Russian Army
 “ (which have been separated in their advance by the marshes of Pinsk) on
 “ their entry into the region of the Vistula, and, on the other hand, to bar
 “ against an invader access to Lithuania on one side, to Wolhynia on the other.
 “ It need hardly be said that this fortress adds great strength to the line of
 “ the Vistula. Speaking generally, the theatre of war in Poland is very
 “ favourable to the defender when the watercourses are free from ice ; not
 “ quite so favourable during hard frosts.

“ Thanks to the configuration of its frontier, the German base of operations
 “ may envelop the theatre of war on the middle Vistula. The most important
 “ points of the base at once strike the eye ; Kosel, Breslau, Gross-Glogau on
 “ the right ; Posen in the centre ; Thorn, Graudenz, Boyen, Königsberg,
 “ Dantzic on the left. These strongholds contain a sufficient number of
 “ magazines and hospitals, and are abundantly provided with warlike stores.
 “ They are connected with one another and with the interior by railways.
 “ They can communicate readily with the field army wherever it may be. They
 “ are situated in fairly prosperous and flourishing districts. All are on good
 “ lines of defence, and, except Breslau, well fortified. The base of operations
 “ against Russian Poland, and subsequently against Russia, would thus possess
 “ all conditions desirable, whether from the military or from the administra-
 “ tive point of view, if its flanks were only secure. The left flank, indeed,
 “ rests upon the Baltic, and may be looked upon as safe, but not so the right

"flank. The German base is seriously menaced, both in flank and rear, on the side of Bohemia and of Silesia; indeed, the fate of all Prussian Silesia seems to depend upon the issue of a single battle. Therefore, in a war against Russia, Germany has the greatest possible interest, from the military point of view, in having Austria for an ally, or at least in being quite sure of her neutrality.

"In choosing his line of operations, the German Commander-in-Chief will be guided by three special considerations; first, that he will be able to bring his force into action more quickly than the enemy, in consequence, if for no other reason, of the more complete development of the German railway system; secondly, that the German base envelops the Polish theatre of war; lastly, that Russian Poland has but little cohesion with the rest of the Empire in consequence of the marshes of Pinsk.

"The (probably) more speedy strategical deployment of the German Army will give it the opportunity of surprising the Russian forces already stationed in the basin of the Vistula, and of cutting them up in detail.²

"The overlapping form of the German base will make any line of operations, having for its objective Russian Poland, strategically safe, and will give the Commander-in-Chief considerable facilities, should he wish to change that line.

"The want of cohesion between Poland and the remainder of the Russian Empire will naturally suggest to the German General the idea of slipping in between the two, of completely isolating the regions of the Vistula, of overwhelming its garrison, and of preventing the arrival of reinforcements from the interior.

"Whether the main German operation should be directed from Posen-Thorn against the triangle Warsaw, Novo-Georgiewsk, Sierask, or from Königsberg-Boyen against Brest-Litowski, whether to play a safe or a bold game, whether to aim at the Russian Army or at its communications, he who has to decide this question must go beyond mere geographical considerations; he must take account of a great mass of circumstances, and above all he must reckon up the armed force which Germany can hurl on Russia.

"We should exceed our limits if we attempted to combine these different elements.

"Our rapid survey satisfies us that the north-eastern frontier of Germany forms an excellent base both for offence and defence. The strategist will find in it almost an ideal theatre of war, a field for numerous and varied combinations."

We will conclude this paper by quoting the last paragraph of the pamphlet by "ein deutscher Offizier":—

¹ The undoubted superiority which Germany enjoys over Russia, both in regard to speed in mobilization (owing to better organization) and to speed in concentration (owing to a more complete railway system), may be counterbalanced, or even more than counterbalanced, by the manner in which the forces of the two Powers are distributed in peace time. In Germany each corps occupies its own district. In the frontier provinces (East and West Prussia, Posen, Silesia, and Pomerania), there are four army corps, consisting altogether of 100 battalions, 22 regiments of cavalry, 63 batteries of artillery = 272 guns, and 4 pioneer battalions. All these corps are on the peace footing. In the Russian frontier provinces directly bordering on Germany, i.e., in the military districts of Wilna and Warsaw, there are at this moment (as we learn from Hauptmann v. Tröltzsch's "Dislocations Karte der Russischen Armée," which was lately laid before the German Parliament), 252 battalions of infantry, 30 regiments of cavalry, 80 field batteries with 320 guns, 13 horse artillery batteries with 78 guns, and 11 battalions of engineers. The cavalry and horse artillery are nearly if not completely on a war footing.—L. G.

² See previous note.

"If the Emperor Alexander after this meeting" (that with the Emperor of Germany in 1879) "made use of the words attributed to him, 'Thank God, a war with Germany is impossible,' he certainly expressed the feelings of the great majority of his loyal subjects, and those words will not be wiped out either by Nihilist or Panslavist agitators, nor by certain discontented statesmen and Generals, who after sharing many a disillusion during the late Russo-Turkish War, may wish to satisfy their ardent thirst for glory at the expense of Germany, but who might possibly find out by experience that it is more difficult to gain their object in a war against that Power than even in one against Turkey."

LUMLEY GRAHAM.

*The German Frontier Provinces.**Distances by Railway.*

	Eng. miles.		Eng. miles.
Berlin to Stettin.....	83		
Stargard.....	105	Branch to Posen.....	105
Belgard.....	173	Branch to Colberg.....	22
		Posen.....	140
Stolp.....	230		
Dantzic.....	311		
Königsberg.....	370	Branch to Prottsken (Russian frontier).....	120
Berlin to Küstrin.....	50	Branch to Stettin.....	60
		Glogau.....	95
Kreuz.....	116	Branch to Posen.....	50
Schneidemühl.....	152	Posen.....	60
Dirschau.....	264		
Marienburg.....	275	Howo (Russian frontier).....	90
Königsberg.....	365		
Insterburg.....	420	Memel.....	90
Eydtkühnen (Russian frontier, for St. Petersburg).....	461		
Berlin to Schneidemühl.....	152		
Bromberg.....	197		
Thorn.....	237		
Berlin to Frankfurt.....	50	Branch to Küstrin.....	20
Posen.....	110	Branch to Glogau.....	70
		Breslau.....	100
Gnesen.....	140		
Thorn.....	195		

	Eng. miles.		Eng. miles.
Berlin to Thorn	195		
D. Eylau.....	255	Branch to Ilowo (Russian frontier)	45
		Marienburg.....	40
Korschen	340	Branch to Königsberg.....	50
		Prottsken (Russian frontier).....	70
Insterburg	385		
Eydtköhnen.....	410		
Berlin to Frankfurt	50		
Glogau	140		
Breslau	200	Branch to Wilhelmsbrück	55
Berlin to Frankfurt	50		
Guben.....	80		
Sagan	120		
Liegnitz	165		
Breslau	208		
Berlin to Cottbus	70		
Horka	115		
Liegnitz	170		
Breslau	213		
Breslau to Oppeln.....	50	Branch to Dossowska	20
Myslowitz (frontier of Poland and Galicia)	95		
Dantzig to Dirschau	20	Branch to Marienburg (crossing the Vistula).....	10
Laskowitz	75	Branch to Graudenz (crossing the Vistula)	14
		Jablonowo	30
Bromberg	105	Branch to Inowracław	29
Thorn	145	Branch to Alexandrowo (for Warsaw).....	10
Inowracław.....	166	Branch to Bromberg	29
Gnesen	201	Branch to Posen	30
Jaroczin	241	Branch to Posen	41
		Oels.....	56
		Breslau	76
Kempen	297	Branch to Wilhelmsbrück (frontier).....	6
		Breslau	49

	Eng. miles.		Eng. miles.
Dantzic to Dossowska	346	Branch to Oppelu	20
Schoppinitz	381	Junction with railway from War- saw (Russian).	
Myslowitz	384		
Oswiecim	399	Junction with railway from Cra- cow (Austrian).	

N.B.—We have only attempted to show the distances between the principal places on the main lines leading from the capital to the frontier, and on the most important connecting lines and branches. The number of the latter is very great, especially in Upper Silesia.

For more complete information about the German railway system our readers are referred to Ottersky's excellent map of "Mittel-Europa," in four sheets, and to Hendschel's "Telegraph."

*The Russian Frontier Provinces.
Distances by Railway.*

	Eng. miles.		Eng. miles.
St. Petersburg to Düna burg	298	Branch to Riga	120
		Smolensk	220
Wilna	394	Branch to Libau	192
		Wirballen (east Prus- sian frontier)	106
		Minsk	105
Bialystok	528	Branch to Prostken (east Prussian frontier)	43
		Brest-Litowski	90
Warsaw	627	Branch to Mława (east Prussian frontier)	66
		Ivangorod	57
		Kowel	189
Moscow to Smolensk	237	Branch to Düna burg	220
		Orel	218
Minsk	423	Branch to Wilna	105
		Bobruisk	87
Brest-Litowski	615	Branch to Bialystok	90
		Kowel	72
		Kiew	365
Warsaw	735	Branch to Kiew (viâ Kowel)	486

	Eng. miles.		Eng. miles.
Warsaw to Alexandrowo (near Thorn).....	129		
Warsaw to Czentochau.....	129		
Schoppinitz (Silesian frontier)	174		
Warsaw to Granica (viâ Czentochau Galician frontier)	174		
Warsaw to Koluszki (on Czentochau line)	60	} Projected lines viâ Lodz.	
Lodz	76		
Kalisch	136		
Wilhelmsbrück	136		
Warsaw to Slupce (viâ Kutno and Konin, projected) ..	135		
Sandomirz to Koluszki (projected)	95		

N.B.—Our readers are referred for further information about Russian railways to Henschel's "Telegraph," to the map of "Das Europäische Russland," published by the Geographisches Institut at Weimar, and to Ottersky's map of "Mittel-Europa," published at Wesel.

THE TRAINING AND OFFICERING OF RESERVES IN FOREIGN ARMIES.

By Captain H. HILDYARD, 71st Highlanders.

(Continued from No. CIII.)

THE RUSSIAN ARMY.

A FORMER paper treating of the Reserves of the principal European armies was limited to a consideration of their training, and the manner in which they were officered. In the present one, which will be devoted to the Russian Army, it is proposed to pass beyond these limits, an endeavour being made to investigate the several ordinances which at the present time regulate service in this force and its Reserves, and to record the results that have been obtained by them. The principle of universal liability to military service was proclaimed as early as 1870, but it was only four years later that practical effect was given to it by an entire reconstitution of the Army. Before, however, any extensive results could be obtained from the new system, Russia found herself involved in a war which tested all her resources, and afforded an opportunity of seeing in what points her military system was especially defective. This has been taken advantage of, and regulations promulgated in August, 1878, provide for such changes as have been deemed necessary, being