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General Reconnaissances: Their Objects and Value, etc.; Together with Personal Experiences Put Forward to Guide those about to Start on them

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GENERAL RECONNAISSANCES: THEIR OBJECTS AND VALUE, ETC.; TOGETHER WITH PER- SONAL EXPERIENCES PUT FORWARD TO GUIDE THOSE ABOUT TO START ON THEM.

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1. IT has been said, "That man succeeds in life who is best informed"; that that nation succeeds in war which has the best information is an axiom deduced from history, the truth of which cannot be gainsaid.

That a peaceful and commerce-loving nation, whose wide stretching and scattered territories are hemmed in by neighbours, ambitious and unscrupulous, ignorant and arrogant, savage and warlike, should in times of peace seek to gain a knowledge of their respective countries and resources in the interests of peace, progress, and commerce, may at first sight seem an endeavour irreconcilably inconsistent with its aim; yet its inconsistency vanishes, and its true purpose alone stands out in bold relief, when it is considered that the best criterion of peace is to know where and how to strike with effect, and how best to defend one's own; how to coerce and paralyse, as far as possible, with one blow, and to proportion the energy put forth to attain the object desired, so as to minimise the consequences of the disturbance of equilibrium which must arise, and by so doing to economise the force to be kept ready for its restoration; and when it is also borne in mind that the road of progress leads over the dead ashes of man's animal nature and of the pleasures of an untrammelled life, which those who enjoy will only give up by force and not by example.

Great Britain of all nations can least afford to neglect to make use of the strength to be derived from this knowledge of countries and peoples, she being a nation ruling an Empire encircling the globe and

one whose frontiers touch those of almost every nation and people of the earth, some of whom are as highly civilised as herself, others but emerging from the savage state of life, the majority representing every round in the ladder of progress lying between the above extremes.

Such an Empire is of necessity made up of a heterogeneous combination of territories and of the peoples inhabiting them, whom it is possible to incorporate into it to form one of its constituent classes: its lower or labouring class, its middle or trafficking class, and, to a certain degree, its military and upper or ruling classes.

To a nation ruling such an Empire the knowledge of its own constituent parts, and of the countries and peoples surrounding them, is an element of its strength and of its greatest power; indeed it is of the utmost national importance, when it is considered that they may become centres of revolt, theatres of war, or centres of commerce and of supply, both of *personnel and matériel*, for our own armies; considerations of moment, whether we consider ourselves as likely to be engaged as pacifiers, as enemies, or as allies. (See Concluding Remarks.)

Thus it is that surrounding and being surrounded by such varied elements, perhaps of prosperity, perhaps of strife and instability, friends or enemies of peace, commerce, progress, and civilisation, in the interests of humanity, it is essential that the rulers of our Empire should have a full knowledge of the countries within her borders and bordering her, a knowledge to be gained by reconnaissances of the scope and nature to be hereafter touched upon.

2. The main military objects of such reconnaissances are :—

- a. The formation of correct judgments.
- b. The acquirement of the knowledge of the forces to be overcome, and how to attain the end desired with the greatest economy of power.

3. It is an established fact that the results of war are never absolute. This is the natural consequence of the imperfect natures of its agents, viz., man and the animal creation that he calls to his aid. The great wear and tear of a campaign, its concomitant losses, sicknesses, anxieties, fatigues, etc., prevent the realisation of the ultimate aim of all war—the conquering the military force of a nation, *i.e.*, the country and the will of the people, and limit its object to the occupation of only so much territory, and the subjugation of his will only to the extent necessary to force him to yield the object for the attainment of which force was set in motion

This knowledge of the force to be overcome and of the force necessary to overcome it, are to be arrived at by a perfect appreciation of circumstances that may be expected to arise, and by a comparative and just estimate of the moral and physical forces, the strategical talents and tactical organisations to be encountered, with reference to these forces, talents, and organisations as they exist in our own nation.

A knowledge of the above will enable plans to be elaborated and the resisting forces to be weighed and appraised at their proper value.

Thus only is it that correct judgments can be formed and the elements of chance to a great extent eliminated, and results predetermined with an amount of certainty unattainable by any other means.

The light also thus thrown upon the power of a neighbour to cope with our own preparedness is an essential requirement of strategy; deprived of it any step taken must be a step taken in the dark, full of danger perhaps, by chance only the right one.

The success therefore of a military venture will be the greater or less as its various steps are traced beforehand, and all available force simultaneously applied to its attainment; the more this force is compressed into one act, and the duration of its action into one moment of time, the better.

This economical application of power, the simultaneous application of a force sufficient to attain the end desired, is also to be deduced from the results of general reconnaissances, and is one of their main objects.

4. War has been aptly likened to a slow disturbance of equilibrium, a weary wearing away of force, the lasting powers of which can be nicely calculated when the conclusions drawn from former experiences are made use of. Given the living agents, all military operations hinge upon time and distance, factors largely influenced by a multitude of considerations, to be prepared to meet which beforehand is to be forearmed, to leave which to chance is to trust to a fatalism scornfully ironical and proverbially antagonistic to those who neglect to help themselves.

Some of the most important of these considerations influencing the course of a campaign from its inception, through its various stages, to its termination, will now be cursorily reviewed.

Tactics is the science of the use of military force in combat; a use greatly influenced by knowledge of the nature of the ground to be fought over.

Strategy is the theory of the use of combats for the objects of the war; to work out its problems intelligently an intimate acquaintance with the moral and physical forces of the armies operating within its theatre, as well as with the topographical features of the ground itself and the communications traversing it, is necessary. Its essence consists in the arrangement of separate marches in view to well-timed concentration and the occupation of important points, now more difficult to attain to than in former years, because the size of armies and the numerous roads which traverse cultivated countries often cause the strongest positions to lose their value.

The dispositions for the march, its precision, the extent to which its frictions can be lessened on the road by suitable camps, bivouacs, requisitioning (food, transport, etc.), cantoning, dépôts to be formed, bases to be used, lines of communication to be adopted, season of the year to be chosen for operations, etc., etc., all essentials to conversation of power and therefore to success, are capable of being reviewed and reported upon.

The lines of communication are so sensitive that a wrong choice cannot be rectified and may cripple the campaign or render it wholly

abortive; whilst a strong, well-selected line will cause the enemy's movements to conform to your initiative. The best lines, even if the longest, will generally run through the most important provinces and the most flourishing towns. Main communications are most appropriately used for strategical purposes and not by-ways.

The large towns of a district give the greatest assistance to an army—shelter for troops, safe storage for provisions and war materials; their civil workshops, and tradesmen, etc., are of value; military establishments of many sorts are to be found in them; they are in fact essential to the organisation, administration, and maintenance of an army.

Military bases depend for their fitness upon sources of supply and refitment, fortresses to store munitions of war, open towns for storage of provisions, etc.

All ground influences the course of the battle, the preparation for it, the use to be made of it. It is an obstacle to view, or the reverse; it renders war complicated, diversified, and scientific; its influences are never in abeyance.

Uncivilised nations are incapable of possessing the highest military virtues; enthusiasm and fanaticism will in part supply their places. National armies, raised to meet an emergency, and insurgent levies are destitute of the virtues indispensable to a united body; guerillas fight best scattered, and choose a difficult and intersected country. Tribal levies, half-trained Oriental troops, and trained military bodies must be met differently. The more intelligence and a warlike spirit are wanting, the more an army will avoid difficult ground and dispersion and carry out a principle of concentration. A distinction is here made between the warlike and the military spirit. Tribal levies will possibly possess the former; trained bodies may possess both, or the warlike spirit may be wanting.

Ground regulates the relative proportions of the four arms; command of ground has in war a charm peculiar to itself; it gives command of view, a more easy application of force, a sense of superiority unwarranted by the truth.

The connection of ground with a defensive position is a double one—strategical and tactical. Strategical as regards its influence on the course of the campaign and defence of the country; tactical as multiplying force by adapting its defensive characteristics to the requirements of the several arms.

Mountain ranges and hilly country introduce into war a retarding principle on account of the difficulties of marching, transport, provisioning, etc.; they act as barriers, limit view and movements, shelter irregular troops, etc.

Rivers influence operations as barriers with certain points of passage only; they influence provisioning, lines of communication, etc. They require the assailant to act concentrated, and expose him to dangers.

Forests are of value both strategically and tactically. In rear of a defensive position, they enable the defender to see clearly and to develop his plans later than the assailant. They assist in giving cover and facilitate a retreat.

The above considerations will suffice to indicate to what a great extent the course of a campaign is influenced from its very conception and initiation, through its various phases, to its end, by the physical features of the country to be operated in, the position of its centres of supply, the direction of its main lines of communication, the character of its inhabitants, etc., etc. To enter on a campaign without having considered such influences would be for a commander to betray the high trust committed to him should the means and the instruments necessary to their consideration have been placed within his reach and he have neglected to employ them.

Although it is necessary that a commander should appreciate the true value of accidents of ground, yet the dangerous attraction of localities must at times be avoided, and the principles guiding the dispositions of troops must often ignore them; the plan of operations must seek primarily to conduct armies so as to ensure concentration, and to give them a fair field of action; the training of the troops must carry out the rest. These considerations, together with those given above, must be equally weighed in the balance. A just determination will be found to lie between the extremes of seeking to fight on ground well known, and refusing the combat on any other, and that of accepting battle on haphazard ground, *i.e.*, between the ideal of caution and full preparation to meet all emergencies, and that of a determined and resolute forward movement trusting alone to organisation, skill, and the first direction given to the heads of columns to work out a success. A commander should therefore ever bear in mind the value of the knowledge of country and people in the business of war, and lose no opportunity of turning its acquisition to his advantage by seeking to gain it by general and special reconnaissances.

GENERAL AND SPECIAL RECONNAISSANCES.

5. Reconnaissances may be classed as general and special; the former carried out in detail in time of peace, are intended to procure the most accurate information concerning countries that are likely to become theatres of war or centres of supply for our own armies, as well as concerning foreign armies and their war establishments.

It is to the consideration of general reconnaissances alone that this paper is limited. Special reconnaissances are treated of in all military manuals; not so general reconnaissances. Before the latter can be attempted an officer must be thoroughly trained in "special reconnaissances." (See para. 10.)

6. General reconnaissances therefore must consider our own as well as foreign countries. One of their primary objects is to procure the necessary *data*, in the first instance, for political and military study, and, secondly, for drawing up plans of operations, especially in so far as the first concentration and movements of an army are concerned. Inasmuch as the possession of a certain tract of country can never of itself act decisively, their scope becomes widened, and their attention turned to the living forces moving over the tract, which must always be of the greater importance.

The national character as well as the characters of the ruler and administrators for the time being are important points in determining the military value of a people.

In spite of taking and keeping the initiative, the means most conducive to enable a general to select his own fields of action and to obtain thereby all its concomitant advantages, he may be drawn by the operations of the enemy into positions and directions never foreseen, as well as into tracts of country, the peculiar topography of which may be unfavourable from more than one point of view.

That country is favourably adapted to the carrying on of military operations which is favourable to the movements, fighting, and subsistence of troops.

7. These main considerations influence the direction given to a general reconnaissance, and should be chiefly considered in drawing up its report; observations on the means of defence or lines of offence bearing in preference on the obstacles and military positions, etc., which lie along the principal lines of communications; those on which natural and general advantages are so combined as to form of themselves, or in conjunction with artificial obstacles, a good line of defensive or of offensive operations, being primarily considered.

A general opinion, giving a clear, general exposition of this nature, drawing special attention to the most important points, which may then be studied in detail, is to be preferred to a voluminous memoir considering every conceivable kind of position under every possible strategical combination. For purposes of perspicuity, therefore, reports should be drawn up in general and in detail. General reconnaissances must, consequently, be simple as regards their object, and thorough on the points concerning which information is desired.

These reports are sensibly facilitated by the number and quality of modern maps and works on geography, general history, inclusive of the newspaper history and records of the events of the day, military history, memoirs, regimental records, etc., etc., *i.e.*, by works of travel, history, and military literature generally. The sketches and reports of sportsmen and travellers are often of great value.

From these sources of knowledge the military information required has to be deduced and brought out in relief. In this respect tables of statistics are of great value, giving information concerning the population, head of cattle, cultivation, manufactures, etc., of a country, in a form at once practically useful. Reports made by Governments on the progress of public works, budget estimates, law reforms, commercial reports, etc., contain military information of a very valuable nature.

8. In systematically carrying out general reconnaissances, and, especially when examining countries likely, from political reasons, to become theatres of war, care should be taken primarily to acquire the information which may be wanting concerning the military geography and military statistics of the country in question, and to bring the information already acquired (especially maps) up to date.

Journeys undertaken for these purposes, the necessary preparatory special study and the reports made as the result of observation taken, are, moreover, the means of training officers entrusted with such like missions; the importance of this training should not be underrated.

9. In general reconnaissances the most accurate knowledge of the country to be reconnoitred that can be acquired before-hand from materials existing is, therefore, of essential value. We avoid thus losing time in acquiring what is already known. What is required is new information, or, at any rate, what is old brought up to date. The military history of a country is of great value towards giving hints as to the course of action to be pursued under varied circumstances. Many conditions of making war remain constant, and the truism that history repeats itself is not to be lightly disregarded.

10. The information gained by general reconnaissances requires to be supplemented by military reconnaissances of a special nature, the necessity of which will perhaps alone become apparent after the former has been carried out and its results studied. From them an opinion founded on observations actually made on the spot, and with a view to either the actual military situation at the time, or to a supposititious situation, is what is in most cases required, the facts and information on which the opinion is founded being given. Much of this special knowledge can be abstracted from general reconnaissances.

General reconnaissances approach to the character of special reconnaissances when carried out under some special supposition, such as, "offensive or defensive operations," "concentration of troops," "march of an army in a given direction with a definite object." Practically, this generally takes place after the plans of the first military operations to be undertaken have been decided upon and mobilisation is about to be ordered.

The information gained by special reconnaissances, drawn up by numerous individuals even though trained after various methods and to different degrees of excellence, trivial and unimportant though they may seem, yet, when systematically collated and combined, goes far towards the formation of a homogeneous whole, if each reconnoitrer has clearly and faithfully recorded what he has seen and heard whilst reconnoitring.

A methodical training in military academies in special reconnaissances is of more than ordinary importance. The words or map of a reconnoitrer must convey to the reader of them the impression intended. One man must not call, or represent, a mountain a hill, and another must not describe an undulating as a hilly country, a wood as a forest, or a dwarf tree as one giving timber. Climatic terms; hot, cold, etc., must not be loosely used.

11 The qualities of body and mind essential to a reconnoitrer are endurance, a good eye for country, an accurate judgment, and a quick perception—qualities possessed by most men to a greater or less degree; by all capable of being cultivated and widely developed by practice. These natural gifts, when properly trained, go far towards fitting the special reconnoitrer to carry out a general reconnaissance.

12. The first and foremost knowledge requisite for the carrying out effectually of a general reconnaissance is the most thorough general knowledge of the military sciences and details of military life, without which the conditions of the movements, fighting, and subsistence of troops cannot be thoroughly understood. By a trained observation, by study and practice, the reconnoitrer will be enabled to grasp instinctively the points on which, both as regards the people and the ground, it is desired to obtain information; its result is a sound military judgment.

13. As home defence is to a nation of first importance, the great part that the general reconnoitrer should be called upon to play when considering it will now be considered. The foregoing remarks on the value of general reconnaissances refer equally to home and to foreign countries; those that follow apply chiefly to the home country, colony, or dependency, and home defences, and will endeavour to indicate the value of such home reconnaissances and the objects to the attainment of which they may be most profitably directed, *i.e.*, to the defence of the country and the selection in times of peace of points to be fortified, communications to be improved and opened out, war establishments and mobilisation centres and supply depôts to be planned, etc.

Nations and peoples are often called upon to make large sacrifices to gain even a sense of security. The reality of true security to be gained by forethought at a comparatively infinitesimal cost is too often neglected, and a lavishly costly expedient, indifferently able to supply its place, adopted in the end; the old adage "Penny wise and pound foolish" does not hold in cases of national moment, for in addition to the pound sterling is the loss of prestige and self-respect, beyond the price that gold can pay for.

14. All warfare, whether in our own or foreign countries, must be preceded by preparation for it. This includes besides the organisation of armies and munitions of war, the preparation of the country itself for carrying on war advantageously by the construction or planning of the necessary buildings for the purpose—not only military establishments, but also communications and fortresses.

Improved means of locomotion, by rail, road, and water, serve continually to diversify strategical considerations. Numerous roads intersecting a country are in every way favourable to military operations, especially is a good longitudinal frontier communication essential to an economy of force and to its security.

Railroads are of higher importance than roads and river communications, in a military point of view, for certain periods of a campaign, and in certain directions, *i.e.*, for concentration, rapid movements from one theatre of operations to another, all movements from front to rear and *vice versa*; the evacuation and provisioning of an army. Railway communication is rapid, continuous, and economical. Nearer the enemy, roads are of the greater importance.

Every new line of railway adds a fresh element of strength to a system of national defence, and with the efficiency of each separate line of railway the military strength of the country increases, for they serve to control

both time and distance, and commercial, industrial, and agricultural enterprise follow in their wake (para. 4). In their conception, therefore, a far-seeing policy must ignore a short-sighted economy. They are great civilising influences.

Railways thus exercise commercial, military, and political influences of the highest importance and are essential to the development of semi-civilised lands and peoples. Our Colonies have largely availed themselves of them to the increase of their strength and wealth. Had China run her railways to her frontier to meet those of Russia she would not now be in her present parlous state, and had India done the same westwards and northwards from Quetta and the Persian Gulf respectively she would have saved herself much anxiety. General reconnaissances should have brought out these wants in bold relief. (See Concluding Remarks.)

Improved communications also render necessary a change of political frontiers and a reconstruction of administrative limits; the establishment of our Empire in India and that of Russia in Central Asia exemplify these points. These necessary adaptations are, or ought to be, ever progressive. We are slow to acknowledge their necessity. Russia gives a notable example of a far-seeing administration, pushing pioneer-railways to gain future advantages; and India an equally notable one of their neglect, even when necessary to the development of outlying provinces. (See Concluding Remarks.) Russia has several times within the past few years re-arranged the Governments-General of Central Asia to meet the requirements of military bases of operations against Turkey and Persia, Afghanistan and India, and China. Their object is to have each base a distinct civil and military unit under one undivided control. Her re-arrangements are never in abeyance.

15. Fortresses, if well placed, must determine both the line of advance of an invader and the course of the defence of which they form the *points d'appui*; being immobile and bound to the spot where constructed, the selection of their sites becomes a matter of national importance and only to be reasonably decided upon when, and in so far as, one is in a position to determine how they will answer the purposes of war. The possibility of thus determining depends primarily on the permanent nature of the geography of countries; but cultivation, communications, resources of the neighbourhood, home politics and relations with other countries, and political boundaries must also be considered.

It is only on a foundation of so universal, geographical, and political a character that places can be decided to be worthy of fortifications—as being of importance in politics and in strategy, not for small objects, and not merely suited for the purposes of one war, but for those of all possible wars in the locality in question.

The importance of these places must also be supposed to be permanent, or to be of long duration.

16. The most secure basis for the choice of such points, to secure the best possible use of the ground fortified, rests on the geographical configuration of the country, for it regulates:—

- a. The sites of the great centres of habitation, *i.e.*, cities.
- b. The systems of communication between them.

Both are aids by which war must be carried on, and their possession is consequently essential.

The large towns of a district give the greatest assistance to an army (see para. 4); they are centres of provisioning, billeting, organisation, and of communications.

The home army must secure to itself intercommunication between such places by holding those points which are essential to free movements; such points, in the system of communications, are those the occupation of which would influence their use for considerable distances, *i.e.*, passes, defiles, etc. The most important of these are those which present the greatest natural obstacles, which are most difficult to turn, and towards which the greatest number of communications converge; such are generally found at important river crossings. These are also important as junctions of communications, as centres for concentration of troops, and for bases of operations; they enable armies to act in many different directions.

Hence to prevent the frittering away of the army, these essential points must be held by the minimum of troops. The means to this end is their secure occupation, *i.e.*, their fortification in time of peace, or at least the planning and laying out of the works, and the collections of the necessary material for their construction.

17. A general reconnaissance of the Punjab, on the principles already enumerated, is most desirable. It is one worthy of the close study and attention of the military student. Here the necessary preliminary study insisted upon as essential to the success of a general reconnaissance, would not only require that the reconnoitrer should traverse the length and breadth of the Punjab with all available topographical information in his possession, but that he, as well, should have thoroughly mastered several of Napoleon's campaigns in Europe, more especially that of 1814, exemplifying the bearings of rivers and river crossings on the strategy of a campaign.

The selection of the site for a bridge across a wide river is as much a question for the soldier as for the engineer. Such a site has a tactical and strategical value as well as a commercial one. The same remarks apply to the alignment of many lines of road and railway. Such considerations are best committed to soldiers, and all frontier communications should be under them.

Such localities are therefore to be chosen, as above suggested, with reference to the organising and maintaining of armies and navies, to serve as entrenched camps, war-harbours, arsenals, manufactories of war-material, war-dockyards; as magazines and dépôts for safe storage of war-materials, etc.; as well as with reference to the movements of armies and navies, both to serve as barriers, and as means of securing a free passage in the presence of an enemy.

18 In all cases, view must be had to the possibility of conforming the ground to the uses of the home army, and to render it eminently unsuited to those of the enemy, *i.e.*, it must be chosen with reference to its object as an *enceinte de sûreté*, as well as on account of affording a favourable battle-field.

If the importance of the place, whether in any particular theatre of war or for the whole country, be so great that possibly the result of the campaign or of the whole war may depend on its possession, its importance causes it to be viewed with reference to its capability of becoming an entrenched position, where the struggle will be directed against the person of the enemy and the overthrowing of his army, the place itself being held as a means towards the attainment of the above ends. Antwerp is a good illustration of a place entrenched with the above object in view.

Such a selection of ground and the adaptation of works to it, by reason of the suitability of its natural features aided by art, and of its geographical situation, will prepare a battle-field in the highest degree favourable for the decisive battle of a campaign, to an army unable by reason of small numbers to take the field in unprepared positions.

19. A ground thus favourable is conceivable, without the kernel of a fortified place, somewhere in a part of the country where topographical peculiarities afford special tactical advantages, and where the locality is strategically suited for a decisive battle; but it will be generally found that these localities, because of their inherent advantages, have from early times been secured as fortified places, and hence it is that such favourable situations are generally found to have a fortified post as a kernel. This point may be illustrated by a reference to Kandahar; the mere fact of Kandahar being to-day a large town and of its having been such far back in historic times, points to its importance as a centre of commerce and communications; that it is also a fortified town, of a strength beyond that of other towns in the same neighbourhood, serves but to doubly certify to its military importance and to indicate it as also occupying a site of strategical importance considered relatively with the existing systems of communications. (See para. 14.) The same arguments apply to Kabul, Herat, etc.

20. It can never be possible to furnish the theatres of all possible wars with permanent fortifications, which will suit every requirement that may be expected to arise; the interests of civil life, considerations, technical and economical, prohibit this; want of time and money and political grounds may render it impossible even that such should be commenced.

Indeed, it will be impossible to force upon the consideration of the authorities, until emergency and the pressure of circumstances make their want stand out clearly, the importance of certain points. Hence arises the value of stable deductions to be drawn from a general view of the topography, history, etc., of a State, *i.e.*, the selection of such localities in time of peace, the recognition of their importance and the preparation of plans for seizing, holding, and provisioning them.

A well-conceived reconnaissance will not only draw attention to the keys of the country, as indicated above, but also to the numerous transformations of the existing condition of its theatre, by constructions and demolitions, which must take place in the closest possible connection with the military operations; and, by noting the previous preparation of

materials and workmen, etc., required, will enable the best uses to be made of whatever exists on the spot, and thus obviate waste of transport and time.

21. The considerations given will, it is hoped, serve to indicate the value of general reconnaissances, their wide scope, and the study, preparation and training required by an officer ambitious to carry one out. The opinions are chiefly those of the military writers of the day who have given their attention to the subject.

Let us now consider the actual field work necessary to their execution.

22. The training of an officer in reconnaissance duties received by him in the military schools and colleges, or what may be called the training of a special reconnoitrer, will be of the utmost use to him as a general reconnoitrer, if he has mastered their minutæ and yet does not allow himself to be trammelled by them.

The *data* of the problem he has now to solve have changed, and it is his object to gain all the military, commercial, and topographical information he can with the greatest accuracy obtainable, and very possibly without drawing attention to his movements, and in the least possible time. The more skilled the reconnoitrer is in the use of compass, sextant, plane-table, theodolite, and level, the better will be the results of his rapid work.

Whilst driving, riding, or sailing, according to the circumstances of the case, selecting that mode of travelling most convenient to himself or dictated by the nature of the country to be traversed, accompanied, perhaps, by an escort or guide, he must at a glance be able to note features of ground, positions of strength, nature and methods of cultivation, distances, heights, slopes, etc., etc., *i.e.*, as many of the minutæ required to be reported upon when carrying out special reconnaissances of country, communications, defiles, mountain districts, etc., etc., as possible. He must carry in his eye standard measurements of distance, height, slope, etc., and be able to judge them with accuracy and note them down quickly, perhaps without drawing rein, and always without attracting greater attention than that which must of necessity be drawn by every traveller out of his own country.

The topographical reports of a geologist are generally better and more instructive than those of others. There is a connection between the occupiers of a soil and its nature which determines their mode of life as settled agriculturists, as nomads, etc.

With a knowledge of the soil it can be predicted whether nomads can be settled as agriculturists, etc., etc. A knowledge of botany and of ornithology is useful, but less so than that of geology.

23. When the reconnoitrer takes up his headquarters in a town and can ride or walk or sketch or photograph round about its neighbourhood at leisure, his work becomes that of a special reconnoitrer, not touched on here.

24. Let us now assume the case in which it is necessary to draw up a military report on a province with a sea coast of from 100 to 200 miles

long, and an area of some 100,000 square miles, during the few months of cold weather, 3 or 4, during which it may be possible to be exposed to the sun during the whole day, that is, a reconnaissance such as an officer serving in India might be called upon to make in some Eastern country beyond Indian limits. Such a report must include:—

1. The coast line; its landing places, harbours, docks, dock-yards, etc., and all communications leading from them inland.
2. The chief communications of the country with the villages, towns and cities along them, illustrated by a route map, giving all the features of the country with an accuracy sufficient to meet military requirements. Traverses of the main arteries of communication which are also the main strategical routes will suffice. (See para. 26.)
3. A description of the forts, fortresses, arsenals, manufactories of warlike stores, etc.
4. An account of the military and naval forces.
5. An account of the mercantile marine and trade.
6. A general description of the country, its habitations and inhabitants, mode of living, clothing, habits, characteristics, etc., etc., food, climate, *i.e.*, details of all matters affecting military operations in the country being reconnoitred. (See para. 4.)

25. Before entering upon the field work of such a reconnaissance, the officer carrying it out will be supposed to have attended to the suggestions made in para. 7, and to have provided himself beforehand with all the aids necessary to its rapid execution. Reconnaissances made without preparatory study can only be useful as a means of verifying military considerations of high importance, or completing our existing stock of information on particular points.

He will be assumed to have then in his possession charts of the coast and the Admiralty directions descriptive of it and the offing; the best maps of the country procurable showing its towns, communications, mountains, rivers, etc., perhaps more or less imperfectly but still with an accuracy sufficient to direct his attention to points that it is necessary that he should visit, and giving the general directions in which he will have to travel. By previous reading he will have acquired a just idea of the climate he will experience, the character of the inhabitants of the country he is visiting, their mode of living, of travelling, money in use, etc., etc. He will then land with a dress suited to the country, and at once proceed to provide himself with an interpreter and means of travelling. He will know what is already known, and not waste valuable time in but retracing the footsteps of others, which he certainly will do unless the suggestions given have been attended to.

It is most essential that the reconnoitrer should keep his own counsel, and understand that his success depends upon his keeping his intentions secret, and in the display of the tact necessary to avoid

danger, whilst at the same time he carries out his intentions without attracting observation. He should confide in none and pass as a traveller: during his absence the less heard of him the better.

26. The nature of the field survey equipment required will be regulated by the following considerations :—

1. Travelling and route surveying must be carried out conjointly and at the quickest possible rate. This rate will be found to vary: when strong ponies are used, between 30 and 40 miles a day. Besides the endurance of the "mount" that of the transport employed and the distances apart at which travellers' rests are met with, or water and grass are obtainable, etc., regulate the daily journey. If travelling is carried on continuously for three months without change of transport the rate may not possibly exceed 30 miles a day with mule cart; 25 miles with pack mule; and 15 to 20 miles with camel or donkey carriage or bullock cart; if for six weeks only, at a stretch, a good pony will average 33 to 35 miles a day if a fast pace is not required of him, and carriage can be procured to keep up. So working, transport will be required to be fed on dry food.¹ A dry ration to be got in most countries is:—

Barley, beans, gram, Indian corn, or millet grains,
Bran,
Chopped straw
Salt,

well moistened and thoroughly mixed.

A reconnaissance survey is most conveniently carried out on horseback, and less so driving or in any sort of conveyance carried by porters. In the latter case, should there be any difficulty in changing carriers, the above rate of progress will not be attained; if, too, the district traversed is mountainous, a deduction on this account will be necessary.

2. Surveying from horseback, all changes of direction will be most readily taken by a large-sized (2 inches in diameter) pocket compass, hung round the neck and fitting into a high breast pocket, lined with (chamois) leather. A prismatic compass, provided with a rapidly steadying dial, may be carried in the holsters for exceptional use. Carefully select both.

The compass used by the explorer should be of the watch pattern with the card swinging with the magnet, and graduated to 2° or $2\frac{1}{2}^{\circ}$. (See sketch.)

This compass is not too sensitive, can be used on horseback, and the angle is taken from the breast, *i.e.*, "glanced," by bringing the mark on the rim, which should be 90° from the handle and check spring, into line with the direction of the road, or object to which the angle is taken and not the eye—an enormous advantage when secrecy is required.

¹ In all daily about 8 to 10 lbs. of grain and 8 to 12 lbs. of chopped straw.

The prismatic compass, Hunter's pattern, with line across the glass let into the top cover, can be worked from the breast; it is too large for the pocket, but could be made to suit, no doubt. Colonel Verner's compasses are unsurpassed, and he could adapt one to meet any requirements.

Working honestly and diligently with such an instrument, distances being measured by time (the watch) and checked daily by enquiry and astronomical observations as hereafter described, results are obtained that those who have only been accustomed to more accurate and less rapid methods will not readily realise or perhaps acknowledge.

A reconnaissance of 800 miles in a circuit, executed as above, on horseback, at a walk, at the rate of 25 miles a day, has been carried out by the writer, the result on return to the starting point giving an error of "nil" in longitude and 10 miles in latitude, showing how relatively correct such a survey may be. It but required to be pentagraphed in between the intermediate and extreme points determined astronomically to become a correct geographical map. (See para. 28.)

Routes run in any direction without closing on the starting point, for thousands of miles, have been found equally relatively correct.

Plane-tabling gives excellent results when surveying can be carried out openly; therefore have one handy for use where possible; for triangulating and projecting points that may be useful in tying the route survey with the plane-table work, not forgetting when triangulating that a base guessed at between two prominent points can be accurately determined later on by measuring a smaller one on the level.

3. Distances can only be estimated by time; therefore at each change of direction, or whenever a bearing is taken, both time and pace must be noted.

Baggage animals and transport generally march at a very uniform pace; it is therefore best to work by both its pace and time. Noting halts and exceptional spurts or hindrances, the average pace is determined at the end of the stage and recorded.

27. The watch should be a silver half-chronometer, with a crystal glass face. A hunting watch, unless provided with a central cut to enable the watch to be read without the face being opened, should on no account be used.

The watch should wind up by means of a key.

The record of direction, time, nature of road, objects seen, cultivation, etc., to be at once noted in a pocket-book. The best size for this book is 5 inches by 8 to 8½ inches. Inside each cover should be a pocket for loose papers, and each cover should be provided with an elastic band and sheath for a pencil; when in use the elastic bands will prevent the leaves being agitated by the wind—a hard H H or H H H pencil is a convenient one for field use; the leaves should not be ruled. This book fits into an average-sized pocket or into holsters, and is of sufficient size to take in large tracts of country when used as a sketch-book. With practice the habit of writing whilst the horse is walking becomes easy, and it only becomes necessary to check him to take angles.

Commence by entering detail connected with the starting point: at every change of direction or of elevation, note time, bearing by compass barometric reading and topographical details, etc. So on, *seriatim* treat all points worthy of note, such as obstruction, soil, cultivation, brook, river, branch road, etc. Note bearings of remarkable objects. Care should be taken to note down all impressions on the spot. Frequently observe temperature. When halting determine the barometric daily wave by hourly observations, recording shade temperature.

Daily at the halt call together the old men, carters, or muleteers, from round about and interrogate them concerning roads to places of interest off the route traversed, and the surrounding country.

The reconnoitrer must devote his whole time and energy to the work and be continuously surveying as described, observing, interrogating, noting, etc.

When riding a restive horse it is necessary to work with a mounted orderly or servant. For greater secrecy it is best to work a few hundred yards behind the transport or escort if one is necessary.

Surveying as above by time, and direction, noting the horse's pace, or, far better, the pace of the baggage animals, which is more uniform, checking distances by numerous inquiries from villagers as to distances from known points, the starting point, the objective point of the day's journey, a route survey can be laid down giving all details affecting military movements, etc., with sufficient accuracy; but for geographical purposes something more than this is required. The reconnoitrer must be in a position to lay down his route on a geographical chart.

28. To enable this to be done he must bring astronomy to his aid; the heavenly bodies may, for the purposes of the traveller, be assumed by him to be so many fixed points to be, by simple means, transferred to his paper and used as checks to correct his daily route surveys, which for the sake of his own ease and for rapidity he has conducted as described. Every sailor finds his way across the trackless ocean by means of a few simple observations, and every soldier aspiring to be a general reconnoitrer must be able also, by simple altitudes of the sun or other heavenly body, to do the same on land. The word "astronomy" need frighten none; of its science the reconnoitrer need understand nothing; he has but to identify a star, by aid of a star chart which he should have in his possession, and to acquire the facility of taking its altitude and that of the sun, or the distances between the heavenly bodies—mere mechanical manipulations to be acquired by a little practice.

If time and secrecy admit, the traverse should be plotted daily. If the field-book is well kept, it can, at leisure, be placed in the hands of a draftsman to plot. The reconnoitrer should carry with him card-board scales 2 miles or 4 miles to the inch, for 2, $2\frac{1}{2}$, $2\frac{3}{4}$, 3, etc., miles an hour, divided into hours and minutes.

By pentagraphing down this field plot on 2 miles or 4 miles to the inch, to a scale of 8 miles or 16 miles to the inch, etc., the result will be an excellent geographical map. Care must, in the first instance, be taken to correctly fix the main points on the smaller scale geographical maps by latitude and longitude, the work on the "dead-reckoning map" being pentagraphed in by sections between these fixed points.

Good results would attend the selection of the six most accurate and rapid reconnoitrers who yearly pass out of the Staff College for further training in a reconnaissance of a position or tract of country, conducted in some such manner as suggested, by compass checked by simple astronomical observations, and necessitating a ride of 30 to 40 miles a day, working against time, and immediately submitting report and sketch completion of the staff ride.

The astronomical equipment may be :—

One 6-inch Hadley's sextant.

One artificial horizon (Captain George's, R.N.).

Two silver half-chronometer watches and a good chronometer, if it be possible to carry the latter.

The only other instruments required will be a travelling thermometer or two, in metal tubes (ordinary, and maximum and minimum), two well-tried aneroids, and a boiling-point apparatus for determining heights :—

One 2-foot ivory folding ruler.

One nautical almanac.

One star chart.

One range finder; refer to Colonel Verner's works for explanation of their great value.

Mathematical instruments.

One telescope or binoculars of best description and power.

One level (eye).

One 100-foot tape.

A photographic camera, 8 inches by 6 inches (best maker), with dry plates, plate boxes, etc., will be very useful if they can be carried or left conveniently at certain points so as to be available when required ; or latest improved Kodak.

All requirements necessary for skinning birds and animals and preserving their skins. A few lessons very desirable. Book for pressing plants.

Each man will also take with him the one or more books of reference that he prefers, but if he has learnt to understand the tables given in the nautical almanac before he starts, the fewer he takes the better. Raper's work is a valuable one and contains tables of logarithms.

The most convenient packing case for the instruments will be the portmanteau of spare clothes.

If a good patent portable log can be obtained for determining the rate of boats on rivers it should be taken, otherwise the boat's rate must be judged relatively to that of moving objects on the shore.

A lead-line, about 50 feet long, for soundings, provided with a lead sufficiently heavy to measure depths up to 30 feet and with alternate yards marked by red and blue tapes, should be carried in the holsters, as it is required whenever a river is crossed. When sailing, or when taking soundings of rivers with strong currents, a landsman will require practice in heaving the lead, and will find sounding to depths of 30 feet from a boat about as much as he can manage.

29. About personal equipment little need be said ; each man has his own ideas upon this subject, and some are fond of luxuries and others are not ; certainly, in the opinion of the writer, this is one of those times in life in which to be blessed with a superfluity of possessions is to be positively afflicted ; to those who are of this opinion the following outfit may commend itself ; in every case it must be borne in mind that the fatigue of travel and of continuous observation is very great, and that it is necessary to arrange everything so as to minimise it, and so to start a routine that thought need not be wasted on it :—

One valise, provided with cork mattress and pillow pocket sufficiently large to hold pillow, change of clothes, night clothes, slippers, etc.

¹ x.—Blankets to be folded and laid flat over the cork mattress.

The edges of valise to be provided with broad flaps pierced with eyelet-holes capable of taking stout whipcord, so that its bottom and sides may be laced together. In the evening it is but necessary to unroll the valise and unlace the flaps to get to bed, and in the morning, to smooth out the blankets, lace the sides together, and roll up the valise, which is, of course, itself waterproof and provided with stout leather straps. If the weather is very cold, to sleep with the sides of the valise loosely laced together gives great additional warmth.

One handbag, to carry all toilet requisites, towel, and odd requirements, such as hand-filter, penknife, boot-hook, corkscrew, matches, etc. During the midday halt this bag only need be opened. At the night halt

¹ To suit the climate.

too, very often, this alone need be unpacked, if the head-pillow of the valise has been well arranged.

One waterproof bag, provided with lock and key, to hold spare blankets, a suit of clothes, waterproofs, spare boots, leggings, one or two tins of food perhaps, and all odds and ends of requirements, *i.e.*, a sort of elastic reserve to hold the overflowings of other packages.

One portmanteau of spare clothes, to also carry the instruments, stationery, etc. Bear in mind that to most Orientals outside India, including the Chinese, short coats and tight-fitting breeches are indecent.

One box of provisions and a few medicines, with notes on their use drawn up by a surgeon, inclusive of three or four bottles of the best brandy, ointment for wounds and sore backs.

Saddlery.

Revolver, gun, rifle, ammunition.

One or more servants' boxes for pots and pans, small iron stove, and food daily required. Saddle-bags are most useful.

Waterproof sheeting. Presents to suit the country travelled in, and estimated to meet requirements.

The above alone is a formidable array of requirements, weighing, if the provision boxes are estimated at 200 lbs., 600 lbs. and upwards.

Keep boots and leatherwork well oiled; the army boot is an excellent one if previously prepared by being saturated with mutton fat; in wet and snow, smear over with mutton fat or oil. For very cold weather, sew blankets and furs into bags; poshteens are excellent. Carry insect-powder and put camphor into pillow-case.

30. As to stores, study the foods of the country and adapt them to use; but however good they may be, a reserve of flour with baking powder, or soda, is desirable for the Europeans of the party. In hot countries a reserve of rice, sugar, and lime-juice is necessary; biscuits, when to take the place of bread wholly for three or four months, should be obtained from a shipchandler's shop or Admiralty baker's at the last seaport at which procurable. Biscuits, rice, tinned butter and milk, if neither can be procured fresh, Bovril preparations, including soups, biscuits, lozenges, cocoa, etc., and Kopf's soups, tea, candles, and matches, will go far to meet all requirements. Flesh, fowl, eggs, vegetables, fruit, fresh or dried, must be sought locally.

All boxes should be packed, and loads bound up overnight; everything required to prepare the morning meal to be carried in saddle-bags, to be thrown over a load at the last moment.

The equipment enumerated meets all the requirements of necessity, and provides sufficient comfort with the expenditure of a minimum of fatigue to secure it; a sufficiency of luxury to preserve health without adding greatly to the amount of carriage required, for it may be assumed that as the latter increases, chances of accident and delays increase, and mobility decreases.

31. Repeating the assumption made in para. 25, the reconnoitrer will, whilst journeying to his starting-point, have met merchants, pilots,

ship-captains, hotel-keepers, and others connected with the land he is about to visit, and from each and all will have acquired information concerning the commerce, the people, the country, the harbours, and the thousand-and-one bits of practical knowledge possible to obtain from those alone who traffic with the people and live more or less amongst them. He will have learnt the prices of transport and riding-animals, rates of hire of carts, carriers, etc., and having landed, can at once complete his equipment for the journey, and provide himself with an interpreter.

In many cases a groom will be found to be the best interpreter, even if his knowledge of English is imperfect, for an interpreter should be ever at one's elbow, and this is the most natural place for the groom (if the reconnaissance is carried out on horseback).

At times to be without an interpreter is of great advantage, particularly so when reconnoitring forts or entrenched positions; the customs regulating such reconnaissances are given hereafter¹; to ask questions concerning them is often simply to court a false answer; observations relative to them, and to landing-places, depths of water, rise of tides, etc., must be matters of personal observation, or they will be often worse than useless, because misleading.

A guide who accompanies the reconnoitrer or traveller from fort to fort, and observes that he endeavours to penetrate each, and that he goes through the same pantomimic expressions of surprise each time that he is denied admittance, and yet that each time he walks round about, peers into gateways and embrasures, and spends some time in the neighbourhood examining the country, the approaches and the commanding ground; and that so soon as he is at leisure perhaps he busies himself with note-book and pencil, becomes suspicious of his innocent intentions; whereas, supposing that he has trotted into the centre of a work without being stopped, if without a guide, the blusterings of the officials, in an unknown tongue, will be less provocative of harm than if he understood them; their revilings will not give him a moment's uneasiness, and whilst exhibiting surprise at finding himself an object of their wrath, he can display an utter indifference to proceed further, and yet not retire until he has carefully committed to memory many things worth noting.

32. Provided with interpreter and carriage, etc., a start can be made:—

1. At the point of departure itself, or at the nearest point to it have your chronometers rated.
2. Work out the latitude and longitude of the starting-point (or take the necessary observations to be explained hereafter²) and compare them with the known latitude and longitude; or, if not known, do this at the nearest place to it, the latitude and longitude of which are known.

¹ Pages 628, 629.

² Pages 630, 631.

3. At this latter place take the bearings of the sun at sunrise and sunset, and at the time of the observation for longitude and meridian altitude. From these observations the error of your compass and the magnetic deviation can be hereafter determined.
4. Equipped with compass and half-chronometer watch suspended round the neck, and fitting into neck and breast pockets lined with chamois leather; with aneroid, travelling thermometer, glasses, Abney's level, 2-foot rule, tape and lead-line in the holsters and pocket-book in coat pocket, there is nothing in one's appearance to attract attention, and no instruments are to be seen. Be careful to look after the holsters yourself.

One chronometer and aneroid must go with the luggage and be kept as standards of comparison. Work as already laid down in paras. 26, 27, for route sketching, taking the time of each halt and its duration, if not working by the time given by the baggage transport, noting each change of direction and the pace. All works on reconnaissance lay down averages at which men walk, horses walk, trot, and gallop; let the reconnoitrer avail himself of these, but, in addition, each man should practically test the rates of his progress under varying circumstances, and also the time of traversing a mile, and distances covered in an hour.

A day's journey will be found to be in most countries a well established distance and not to vary 10 per cent. day by day.

In addition to the route survey, surveys of the environs of all important places will be required, together with sketches at various points of the route, to exemplify the nature of the country traversed. These may be outline sketches only, and can be taken without dismounting.

With the portable instrumental equipment noted in para. 27, the astronomical observations to be taken may be—for Latitude:—

1. Meridian altitudes of the sun and stars.
2. The altitude of the Pole star off the meridian (north hemisphere).

For Longitude:—

1. The altitudes of the sun and stars taken for watch error (longitude), the former being taken about 8 or 9 a.m. and 3 or 4 p.m. Observe temperature (shade) and barometer.

Regularly observe the rule of getting morning and evening sights for chronometers and for latitude, observing as many altitudes of stars as may be considered necessary.

Work out before starting the approximate times that various stars will cross the meridian. (See page 631.)

It may not be possible, without much waste of time, to take the longitude of the place the latitude of which has been determined by the sun or stars; it will be sufficient in such cases, the intermediate distances traversed being short, to connect the two by the route survey (or dead reckoning) and bearings to distant remarkable objects, the bearings of which objects should be continuously observed as checks on the work.

Observe, when convenient, the times of the rising and setting of the sun and the direction of its centre by compass.

The centre of the sun is on the horizon when it appears its own diameter above it. Take also the direction of the sun's centre by the Azimuth-compass, at the time that a double altitude of the sun is taken ; this observation, with a knowledge of the latitude and Greenwich mean time approximately, will enable the compass error to be determined, *J U. S.*

Work up the note-book every night so that it shall be perfectly legible, add general observations on the day's journey ; trust nothing to memory. A chronometer watch will measure short meridian distances and connect one place with another, so that all may be relatively right ; the watch must be treated with great care. Compare the two chronometers nightly, and determine the watch error at every place the latitude and longitude of which are known, and finally at the end of the reconnaissance at the place the latitude and longitude of which were in the first instance determined. The error so worked out will give an idea of the accuracy of the whole work ; it has probably been accumulative if the chronometers are good ones and have been treated with care, and can be distributed throughout the survey.

Have the chronometers rated on every available occasion.

33. When the reconnoitrer has mastered the rapid means of route surveying described and of checking his work by simple altitudes of the heavenly bodies, the interest of his subject will naturally lead him on to more difficult astronomical observations, giving proportionately more accurate results. Upon these it is unnecessary to touch here, as they would but complicate the method of carrying out a rapid military survey which it has been the object of this paper to show to be easy of attainment, to meet all military requirements, and many geographical ones without attracting undue attention ; indeed, with secrecy. What is wanted is accuracy within itself, and this can be obtained by the methods indicated.

34. Equipped as described in para. 32, the reconnoitrer mounts his horse as if bent on a ride of pleasure ; the use of a pocket compass on horseback, driving, etc., is not much noticed ; it is held on a level with the chest and not to the eye ; star observations, using the sextant and artificial horizon, can often be carried out in the early night.

These and sun observations will never attract much attention so long as it is explained to the onlookers and the curious that the sun is the clock by which you travel, and that as you journey your watch must be daily corrected ; that you wish to ascertain the direction of Mecca, etc. To thoroughly impress this point it is as well to provide the interpreter with a watch to be kept daily at local time ; you will at the worst be thought to be a pedant, and most suspicious of being led in a wrong direction ; and you but do what every traveller should do in a country of which imperfect maps only exist, that is, prepare one for his own use and the advantage of others who may follow him.

CONCLUDING REMARKS.

The form that the report will take must necessarily vary ; guides are given in all "Handbooks on Intelligence."

In drawing up his report the reconnoitrer must bear in mind that it should include not only his own observations, but as well references to those of others, and that it will be necessary for him to extract from the teachings of conventional geography all that is inseparable from the study of nations and peoples. This "Political Geography" should give all the information concerning ethnology, races, religions, geography, etc., that may be necessary, when read in connection with history, to enable the political or military reader to be prepared to meet all accidents, either political or military, and thus deprive accidents themselves of the character of emergencies.

If not already compiled, it is necessary that the report should treat of Government and Government officials, so that those who reconnoitre after him may start with his own full experiences.

The greatest value of a general reconnaissance will be attained if it enable a Government to further a policy of intuition and energy, and to act with foresight and continuity of purpose, and if, by a previous study of the conditions of the game that it may have to play in any country or field of enterprise, it ensures that it shall meet its adversary there at least on equal, if not with superior, chances of success. To illustrate my meaning, I give below extracts from recent writings on India and China; they might be multiplied *ad infinitum*, but they will suffice to show the value of general reconnaissances, for it would have been the duty of the reconnoitrer to have reported on the points so prominently brought to notice therein, and not only to have drawn attention to their importance, but also to their relative importance with reference the one to the other.

A correspondent thus writes to the *Morning Post* regarding "The Need for Action in India":—

"I have been struck by the evils that result to nations from the procrastination of their rulers and their neglect to avail themselves of information at their command or to give to it its proper relative value. The immediate evil to which I would refer results from India's neglect of Baluchistan, a valuable outlying province which she leaves in a state of uncivilisation and stagnation so reprehensible that the Goddess of Progress is now avenging herself on her for this sin of omission. Years ago Baluchistan was ripe for improvement, for the construction of a pioneer railway from Quetta—dipping southward and westward to Seistan to tap the trade to Central Asia and with a connection with the Persian Gulf—and for canalisation by utilising the waters of the historic Helmund, a river once bordered by cultivation studded with numerous cities. India's action as regards Baluchistan has been unstatesmanlike, petty, and parochial, and had Russia been her mistress these works and more besides would have been carried out. Under the guidance of a master-mind new-born Africa is outstripping India in progress, and even the

Soudan has its railway, and if India does not know how to lay a cheap line of a like nature let her requisition a batch of Lord Kitchener's officers to do the work for her. Had these works been initiated a decade ago India would not now be envious of Russia's civilising action, and of her determination to do what she has neglected, and will do for her unless India does it at once. We should copy Russia's policy of constructing pioneer railways in Asia, and run our rails to meet hers, so that civilisation may be advanced and commerce be unimpeded, and we continue to hold our due share of it."

The committee of the Shanghai branch of the China Association, writing in January last on the present condition of foreign trade with China, attributes "The hitherto neglect of the China question by our Government, and the policy of drift into which we have fallen, to a mistaken estimate of the strength of British prestige in the Far East, coupled with a fallacious belief in the power of China herself; the nations, newer in the field and comparatively unhampered by traditions of the past, have seemingly been better able to interpret events in the light of common experience, and have found opportunity in our complaisance and inactivity to exploit the situation to our disadvantage"; and again they point out that it is "A great error to proceed on the assumption that the few high officials who, with the Court, may be said to constitute the central Government, are desirous of seeing China strong, or of maintaining the integrity of the Empire. The people wish it, but public opinion can scarcely make itself heard, much less can it be proclaimed in a way that will influence the Government," etc.; and again: "It may be fairly claimed that the British Government has received, from its Ministers, Consuls, and Merchants, a sufficiency of facts, opinions, and suggestions from which a definite and resolute policy might long ago have been deduced. The future of our relations with China may safely be gauged by the experience of our relations with China in the past; nothing has ever been gained from China except through pressure, backed by force, and nothing will ever be gained from her except by the same means."

That general reconnaissances of countries bordering our Empire and through which our Imperial communications must eventually run, *i.e.*, of China, Siam, Persia, Turkey in Asia, Afghanistan, etc., should be thorough and up-to-date is of the greatest national importance, and that they should be studied when made, of no less importance; for it will always fall to the lot of men who sit in official arm-chairs to decide on the action to be taken; and this is as it must be; for it is possible that the reconnoitrer may have been influenced by his surroundings; the fatigues, discomforts, and dangers incidental to his work, and his reports tinged by enthusiasm or despondency, or what may be termed his "personal error," according as his temperament is sanguine or the reverse; and moreover the home official alone has full knowledge of the bearings of other questions upon the one specially reported upon.

In writing a paper on a subject of such wide extent as the one treated, it was the intention of the writer to confine himself to its main lines, and in no way to tread the by-paths of special considerations.

For notes on details, see "Reconnaissance Hand-books." To make the paper more complete a few details are touched upon in the Appendix.

After reading the works of a traveller, and marvelling at the excellent maps he has produced, one naturally asks oneself, "How did he do it?" The foregoing remarks, it is hoped, will explain how it might have been done. The methods advocated have been practically tried over an extensive area and found to give good results, far better than many will anticipate.

Also one marvels at the prescience of a general who has foreseen difficulties, avoided dangers, and anticipated the very battle-fields on which campaigns have been decided and the fate of nations determined, and one again questions how it was done; and again it is hoped that the preliminary remarks of this paper on general reconnaissances will answer the question. To do it, however, it is necessary to use the proper agents, *i.e.*, a body of officers trained to a certain standard and working to one end. This training the Staff-College course endeavours in a uniform manner to supply, and to men so trained and to others who, by character and tastes, are fitted to carry out general reconnaissances, those responsible for the conduct of affairs turn for aid—at least, they do so if well advised. Those will cavil at this statement who decry all uniformity of training as a bar to genius and a drag on originality; let the adage of the strength of the bundle of sticks be borne in mind, and be sure that genius and originality, whilst drawing advantage from training, will also learn from it when to throw off its trammels and break through its bonds should circumstances arise rendering it necessary and advisable to do so, for genius was never stayed by rein or curbed by bit, and the members of the bundle—symbolising a body of uniformly trained staff officers—are doubtless content to form part of it and to be handled by one understanding its strength. It was not genius and originality that enabled Germany to overcome France, but system, gained by training and welded by discretion.

It may be argued also that England has never worked thus and has never troubled herself about information and reconnaissances, and yet that she is to-day a great Empire encircling all nations. To this it may be answered that she has always, unconsciously to herself, so worked. The officers of her Navy and mercantile marine, her merchants, pioneers of commerce, her adventurers, have always been the best of intelligencers and appreciators of the nation's wants. She may be said to be a nation upon whom the enterprising spirits of her sons have forced greatness.

It behoves Great Britain to beware how she lays down the *rôle* she has thus been elected to play in the world's history, and how she allows herself to get out of touch with her environments; to lose touch with them, to stagnate, will be as surely to die as have died the nations that educated the world before her.

But times have changed, and the tide of opinion has ebbed, and free spirits must seek other outlets and suffer themselves to be curbed by an organised system which can now alone take the place of that self-organised, and so carry on the work so ably performed heretofore by the

nation's often wayward, generally irresponsible, yet nevertheless boldest and truest sons.

One may praise the dead without causing a blush to suffuse his cheek, and the late Major-General Sir C. MacGregor was one of Britain's most prescient reconnoiters. The late lamented Captain Gill was also one of the most enterprising and noble of these: enterprising because, despising the luxury at his command, he voluntarily elected to encounter dangers, difficulties, and fatigues; noble, because he staked all for a reputation to be gained only at enormous risks. Losing his life, he gained the reputation he desired—and that a true and not a bubble one—perhaps impossible to have gained at a less risk or cost.

The reconnaissances of the Russian Colonel Prjevalski are instances of the value of the explorations of one man, should he be a trained observer. No one who has read his works can doubt of their military, in contradistinction to their scientific, value, which is patent to all. The opinions of such an officer are perhaps of more value than that of a *whole commission*, because formed by one trained intelligence cognisant of all details. In one person we find here combined the soldier, sportsman, botanist, ornithologist, geographer, and exploring surveyor. Let others endeavour to tread in his footsteps.

Russia, by utilising the information recorded by him concerning China, has already reaped incalculable advantages over other nations, Great Britain included, who have neglected it.

The results of the expedition about to explore the sources of the Yellow River, under the guidance of Russian military officers, cannot but be productive of important results; for Kashgaria borders on Turkistan, and is only separated from it by the Gobi Desert, in places not the impassable obstacle it is supposed to be. The population of both is Mahammadan, ready to overflow from their overcrowded oases into Kansuh, whose Mahammadan peoples have already proved to be a sword in the heart of Central China, to the Chinese Government. *Vérb. sap.*

APPENDIX.

AMPLIFICATIONS.

Para. 24.

1. In carrying out the reconnaissance of a coast line, an Admiralty chart is required to indicate the nature of the offing and depths. The land reconnoitrer must walk or ride along its edge.

2. Before a valuable report can be drawn up on an arsenal, dockyard, powder manufactory, etc., several institutions of a like nature should have been visited and their machinery, process of manufacture, etc., studied. Torpedo works and schools of electricity, etc., now form integral parts of the war establishments of even fifth-rate Eastern Powers, and such-like matters must be generally understood.

Para. 31.

1. In conducting a reconnaissance of foreign armies, navies, and fortresses, when specially deputed and officially accredited, the greatest

tact and strictest discretion are necessary. Any attempt to procure information secretly and on forbidden grounds, which cannot be obtained in the everyday intercourse permitted with the troops, would be unjustifiable and compromising. Official introduction and consequent courtesy received compel the reconnaissance officer to restrict himself in his reports to what has been voluntarily placed within his reach. Should there be reason to suppose that the latter does not meet the ends desired, freedom of action can only be resorted to on the conditions of having no further reference to and taking no further advantage of the support or assistance of the authorities of the country in which he intends to travel and gather information.

Even in the latter case he is not quite free and unfettered. To bribe *employés* with money, to make surveys, to photograph and sketch in the vicinity of fortresses, are forbidden by the laws of all countries, and the reconnoitrer must be careful of infringing any of these laws.

There are no laws against studying existing maps issued to the public; therefore, the actual reconnaissance may be limited to mentally bringing information up to date and noting changes: in a large fortress noting, not the trace, except in so far as it deviates from the plan in possession, but revetments, whether covered, and of what material, etc., commands, casemates, new works, etc., *i.e.*, details not shown by a glance at a map.

The map of the surrounding country must be carefully studied and the position and communications thoroughly reconnoitred; the military history of the ground—*i.e.*, battles fought over it, sieges it has witnessed, etc.—must be learned beforehand.

In the case of works of moderate extent and simple trace the reconnoitrer need but leisurely pace its chief lines, noting direction, profiles and lengths; memory and eye will not fail to enable him to retrace his footsteps on paper and to lay down sketch profiles sufficiently accurate for all practical purposes. This should be done on the very first opportunity that offers, and the works again visited, if possible, to test its accuracy and to make additions.

“Snap-shots” by Kodaks can be taken without attracting observation and enlarged at leisure with excellent results, but the most zealous seeker after information must be careful to do nothing that may compromise his Government, and remember that the police exercise the right of searching the baggage of suspected persons. He may often have to adopt a shorthand and symbols of his own, and to jot down notes where they are least likely to be looked for or recognised as notes if found.

On account of the restrictions placed upon the free action of a reconnoitrer it is often better for him to have nothing whatever to say to the authorities of his own country; he can always claim from them the consideration due and invariably conceded to travellers, beyond which nothing is required.

Para. 32.

It is beyond the scope of this paper to enter into the solution of the astronomical problems involved in fixing latitude and longitude; it will suffice to explain the observations required to be taken, *i.e.* —

1. Determination of the index error of the sextant.
2. Determination of the altitude of the sun or a star.
3. Determination of the stars crossing the meridian and approximate time of doing so.

The relative positions of the principal stars can be readily determined by means of a star chart.

Sextant Error.

Obtain the index error by observing the sun with the images in contact, and causing them to traverse one over the other. Let the readings be R^1 , and R^2 ; then the index error is half the difference of the two readings on or off, according as R^1 is greater or less than R^2 .

N.B.—One-fourth of the sum of the two readings equals the semi-diameter of the sun, given in the Nautical Almanack for each day of the year. This checks the above observation:—

If the readings are both on or both off, the index error would be the sum of the two readings.

Or:—Obtain by observing a star or very distant object and making both images coincide; the reading on the vernier then gives the index error.

The necessary instrumental adjustments are given in works on surveying, etc.

Altitude of the Sun.

The lower limb (L. L.) of the sun is observed in the morning, when the mercurial sun (sun seen reflected from the mercury) is rising (using the astronomical telescope).

Bring the two images to a slight overlap and note the time at the instant of its disappearance. This must be repeated about seven times as rapidly as possible in order that a correct mean may result.

The upper limb (U. L.) must be observed in the afternoon, when the mercurial sun is sinking.

The morning observation should be taken about 8 or 9 a.m., and that in the afternoon about 3 or 4 p.m.

N.B.—The image of the sun in the mercury is inverted. An astronomical telescope inverts an object or image observed.

In taking a meridian altitude of the sun, bring its two images into exact contact on the L. L., *i.e.*, with the mercurial (rising) sun at the top; keep contact by the tangent screw, bearing in mind the direction in which you are turning the screw and never turning it in the contrary one (to do so is fatal to the observation). So soon as an overlap occurs instead of a gap, the sun's greatest altitude has been attained and the sun's motion in the heavens has been reversed. The reading of the instrument gives the sun's meridian double altitude from which the latitude can be readily deduced. This observation, which must be begun a little before apparent noon, also gives the time of local noon. When a star is observed the two images are made to coincide.

Every night take the altitude of the Pole star, noting time. Having set the sextant to double the approximate latitude, the star and its reflected image will be found readily in the field of the mercurial horizon :—

Be careful to see that the mercury finds its own level.

Use the astronomical telescope on all occasions.

Keep watches at Greenwich time.

Stars Crossing the Meridian.

By sextant and artificial horizon the altitude of a heavenly body cannot be measured unless it is between about 15° and 60°

A star to be observed must therefore come on the meridian during the first and at an altitude of between 15° and 60° . It should be of the first or second magnitude. Having consulted a star chart and the heavens, and thereby determined the names of the stars near the meridian (approximately a great circle passing through the Pole star), to obtain the approximate apparent time of any one of them passing the meridian by means of the tables given in the Nautical Almanack, subtract the sun's right ascension from that of the star (increasing the star's right ascension by 24 hours if it be less than the sun's right ascension), and the remainder is the time required.

The altitude of any star when passing the meridian equals the sum of the co-latitude (90° -latitude) of the place and the declination of the star, when both are north or south, or their difference when of contrary names; the altitude to be reckoned from the south point of the horizon when the latitude is north, and the contrary when south, but when the sum exceeds 90° it is to be taken from 180° , and the altitude is to be reckoned from the north in north latitude and the south in south latitude.

All astronomical observations to be balanced and weighed and noted as "very good," "good," "doubtful," etc.

If possible, go through the course recommended by the Royal Geographical Society prior to starting on the reconnaissance.