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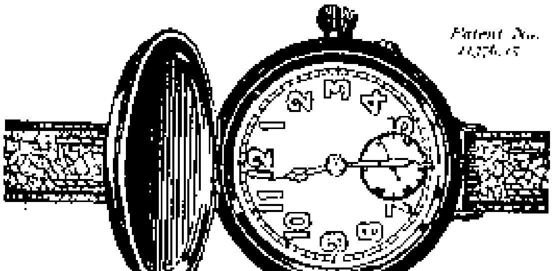

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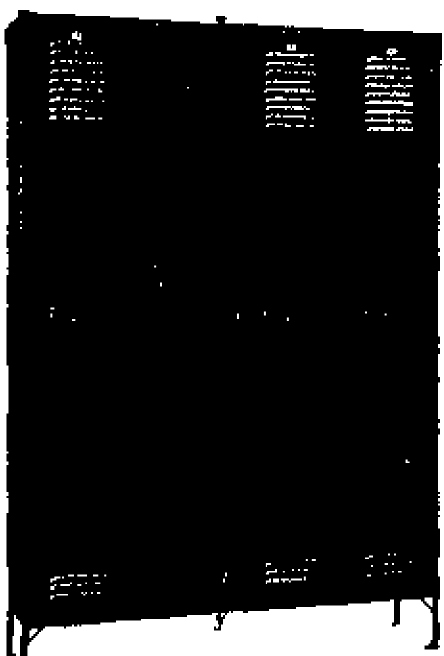

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CONTENTS.

Authors alone ... statements made and the opinions expressed in ... C.A.5281).

THREE-HINGED TIMBER ARCH, 150-FT. SPAN, CALIFORNIA STATE HIGHWAYS.

By MAJOR V. P. SMITH, R.E.

THIS timber bridge, one of many on the main highway from San Francisco to Eureka in the State of California, has been completed only recently and presents some points of interest. The local conditions somewhat resemble those which R.E. officers often meet with in India and the Colonies, that is to say an out-of-the way site to which transport is difficult, a scarcity of materials for masonry or concrete, and a plentiful supply at hand of standing timber of very moderate quality. This case is one in which though the state concerned is by no means a backward one in its methods nor the engineers prejudiced against steel, wood has been chosen in preference to other materials. Moreover despite a considerable span and quite a heavy assumed loading it has been found possible to make use of a comparatively inferior timber, redwood, which is roughly about 30 per cent. weaker than first-class pine

Redwood when dry is lighter than good p'ne, shrinks very little in seasoning, and can be used with safety in a comparatively green state. Its life is estimated at 20 to 30 years. It is weak, like most pines, in resisting compressive stresses normal to the grain. This weakness (which does not always receive the attention it deserves in designing) in this case lead to the rejection of a design for a 180-ft. Howe truss as it involved rather heavy iron bearing plates and castings which would have been expensive to transport to the site. The working stresses adopted were:—In flexure 1,100 lbs. sq. inch; compression in columns 1,100 $\left(1 - \frac{l}{60d}\right)$ lbs. sq. inch; compression perpendicular to the grain 200 lbs. sq. inch; shear parallel to the grain 80 lbs. sq. inch.

The site is a deep gorge with precipitous timbered sides so erection over false-work was not considered practicable. The design selected was a three-hinged crescent-shaped arch, to be erected by lifting the trusses bodily into position by overhead cables.

The loads calculated for were 100 lbs. per sq. foot of roadway on the arch and on the floor 10 tons and 5 tons respectively on two axles 10 ft. apart. This it may be noted is quite a modern and heavy loading. In France for instance our heaviest military highway loading (excepting "tanks") is a 6-in. gun, axle loads 14 and 2·7 tons

respectively on axles 19 ft. 6 in. apart. With some special precautions in the case of the largest loads a bridge of this sort would therefore take the heaviest highway traffic that is known.

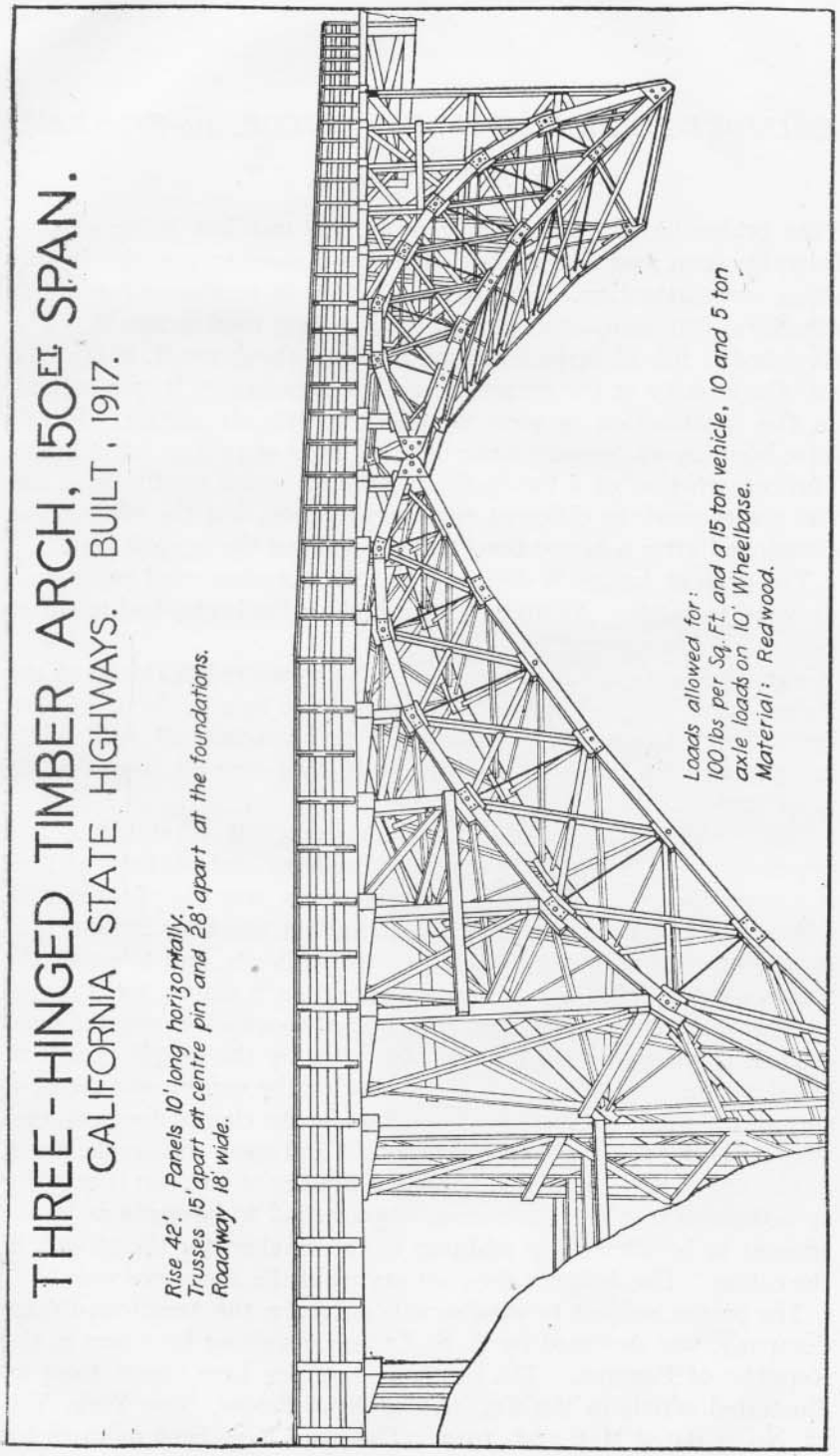
"The shape of the trusses," it is stated, "was determined graphically by drawing funicular polygons for the extreme conditions of loading. The chords were then located outside these polygons in order that no condition of loading would put members in tension. It was necessary to design the joints to take tension, however, particularly those of the lower chord, in order to take care of erection stresses. The dead load and full live load stresses and the positions of the live load for the maximum and minimum stresses in the various members were determined graphically, the maximum and minimum stresses being the algebraic sums of the dead and live loads."

The article on which this description is based unfortunately contains no measured drawings. The drawing produced here, which is the work of Sapper W. A. Johnson, is based on a careful study of the four photographs which were given. The chords were made of 12-in. by 12-in. timbers, the upper chord being spliced at every panel and the lower chord in three places only. The panels measured 10 ft. horizontally. The footings were able to be based on the solid rock, levelled up where necessary by a little concrete. The hinge pins rested on castings anchored to the rock by bolts.

For erection two trestle frames, large enough for complete trusses to pass through them, were put up on each bank and these supported two $1\frac{3}{8}$-in. plough steel cables across the gap. The northern half of the bridge was built complete on the bank and lifted out bodily in one piece, its forward end supported by the cables and dragged by a tackle attached to a hoisting engine. The shore end ran on ground rollers. When the forward end was out far enough it was fixed to the cables and the hauling tackle then picked up the shore end and lowered it into position on its bearings. The two trusses for the southern half were launched separately and were supported by the cables until the centre pins were in position; the laterals and bracing were then fixed. Erection of the superstructure started at the centre and was kept progressing equally outwards.

The bridge required about 90,000-ft. board measure of timber. As this and other structures on the same road used up 500,000-ft. board measure in all it was possible to afford a 35-H.P. saw mill on the site which could turn out 4,000 to 6,000 ft. per diem.

The bridge was constructed under the supervision of Francis G. Sommer, division engineer of the California State Highway Commission, of which Austin B. Fletcher is chief engineer. This description is based on an article in *The Engineering News-Record* (New York), Vol. 78, No. 12, dated 21st June, 1917.


THREE-HINGED TIMBER ARCH, 150FT. SPAN.
CALIFORNIA STATE HIGHWAYS. BUILT, 1917.
Rise 42'. Panels 10' long horizontally.
Trusses 15' apart at centre pin and 28' apart at the foundations.
Roadway 18' wide.
Loads allowed for:
100 lbs per Sq. Ft and a 15 ton vehicle, 10 and 5 ton
axle loads on 10' Wheelbase.
Material: Redwood.

CHIRIQUI RIVER SUSPENSION BRIDGE, 410-FT. SPAN.

By MAJOR V. P. SMITH, R.E.

THIS bridge has no particularly novel features but being of considerable span and an example of recent American practice it may claim some attention. The River Chiriqui is in Panama and this structure, just completed, is to take a wagon road across it. The river bed is full of large boulders, it slopes about 150 ft. to the mile and the velocity of the current sometimes reaches 20 ft. per second, so the construction of piers would be a difficult matter. Floods have been known to cause a rise of water level of 15 ft. in a few hours. The construction of a two-span suspension bridge on the same site was commenced by different engineers in 1909, but the scheme was abandoned after a heavy flood had washed out the central pier.

The present bridge is designed to take a 10-ton road roller or a drove of 50 cattle. All material required for the bridge had to travel the last 7½ miles over a bad road.

The drawings explain themselves. No measured drawings of the towers are available but these appear to have been made up of 8-in. broad-flange I-beam posts with angle-steel bracing, all field joints being made with bolts. The posts, 42 ft. long over all, were sent up in two pieces.

"The most difficult transportation item," it is stated, "was moving four 2⅛-in. cables, each weighing with end sockets 4½ tons including the reel. To haul the cable reels over the 7½ miles with safety it was found necessary to strengthen the floor system of a 230-ft. suspension bridge, to build several culverts, and to repair the wagon road." This is a curious statement as it stands for it is well known that cables have been transported frequently over the most difficult country and the lightest of bridges by the simple expedient of taking them off the reels and distributing the weight on a string of carriers or animals. The use of cast iron for the clamps does not seem very sound for they are exposed to shocks and some transverse stress.

The bridge was calculated to have a camber of 3 ft. but it actually settled down to 2 ft. As is usual a guess had to be made as to the amount to be allowed, in addition to the camber, for the stretch in the cables. The designer does not say what the allowance was.

The bridge, subject to some modifications by the American Bridge Company, was designed by A. S. Zimn, Consulting Engineer to the Republic of Panama. The information given here comes from an illustrated article in the *Engineering News-Record*, New York, Vol 78, No. 9, dated May 31st, 1917. The plans have been redrawn for this article by Sapper W. A. Johnson.

A FIELD COMPANY, R.E., AND DIVISIONAL FIELD COMPANIES, R.E., ON THE LINE OF MARCH.

By LIEUT.-COLONEL ARTHUR A. CROOKSHANK, R.E.

FIELD COMPANY VEHICLES AND LOADS.

Wagons and Loads.—The following three lists show the loads per draught animal arranged in order of magnitude :—

A. Dead or useless load per animal. Empty vehicle only.

	lbs.
1. Water Cart	711
2. G.S. Limber	606
3. Tool Carts	557
4. R.E. Limber	532
5. G.S. Wagon	462
6. Bridging Wagon	350
7. Pack Animal	64

B.—Live or useful load per animal. Load only (exclusive of vehicle). Loads as per Field Service Manual.

	lbs.
1. Trestle Wagon	655
2. Water Cart	620
3. Pontoon Wagon	575
4. G.S. Wagon	524
5. R.E. Limber	482
6. Tool Carts	465
7. G.S. Limber	330
8. Pack Animal	166

No. 5 includes 50 sandbags, 43 blankets, 210 lbs. of explosives, 35 lbs. section officers' kit, 58 lbs. of cordage, 63 lbs. of grindstone, 23 lbs. hose, 14 lbs. nails, 24 lbs. chest pack, 110 lbs. ground sheets, 18 lbs. horseshoes, etc.

No. 7 includes all cooking utensils, 18 dixies, 217 rations, etc.

C.—Total load per animal (weight of vehicle plus articles loaded as in Field Service Manual).

	lbs.
1. Water Cart (full of water)	1331
2. Tool Cart	1022
3. R.E. Limber	1014
4. Trestle Wagon	1005
5. G.S. Wagon	986
6. G.S. Limber	936
7. Pontoon Wagon	925
8. Pack Animal	230
Water Cart, half filled	996

The following vehicles appear high up in the three lists :—

	Average Place.
1. Water Cart	1·33
2*a*. Tool Cart	3·66
2*b*. Trestle Wagon	
4. R.E. Limber	4·00
5. G.S. Wagon	4·66
6. G.S. Limber	4·76
7. Pontoon Wagon	5·33

The points to be noted are :—

(1). The water cart if full of water, should have at least two pairs of animals. If only one pair is available, the cart should not be more than half full.

(2). Freak or non-regulation loads should never be put on to the water cart, tool cart, trestle wagon, R.E. limber, or G.S. wagon.

(3). The pontoon wagon and the G.S. limber are the only wagons which, on paper, can have any extra or non-regulation load added. This extra load should not be allowed in the case of the pontoon wagon as there are other factors to be considered, namely the great height and length of the load which makes it an unwieldy and difficult load to pull, also to drive, and wind pressure on this large and high surface appreciably increases the drag on the animals.

The vehicles most likely to "break up" are the R.E. limber (rear wagon) and the bridging wagons. In the case of the R.E. limber the expanded metal in the sides should be removed, and replaced by sheet iron. This vehicle sometimes gets its back (or floor) broken by uneven or bad loading or overloading and bad balancing. This vehicle should be replaced by a G.S. limber as soon as opportunity occurs. The latter is a far more serviceable vehicle, and it is a mistake to have "freak" vehicles in the service (far better to standardize). Also the G.S. limber being all wood is much easier

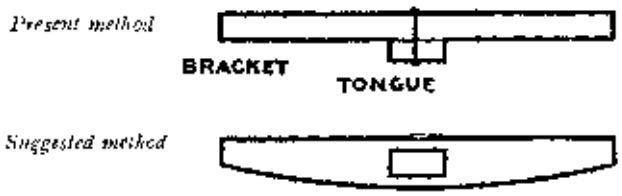
to repair on field service than the R.E. limber which is all metal. The forewagon can be used separately as a two-wheeler, and is handy for local traffic of small loads about camp and near works, also for fetching rations, letters, parcels, clothing, etc. The forewagon of the R.E. limber is a useless type of vehicle, very heavy for the load it carries (*i.e.*, the useless or dead load is excessive in proportion to the useful or live load).

As regards the bridging wagon, this vehicle is badly designed and under-scantlinged in places; parts of the wagon are likely to "give" owing to the above reason, and also because under conditions of motionless warfare, this wagon spends 90 per cent. of its time as a contractor's wagon for carting about building materials. This means that it is loaded in a way it was never intended to be, and that some of its members are subject to stresses they were never designed to take.

The members which most frequently fail are the main cross-brackets, the long runners and the turn-table fittings; these "give out" owing to being under-designed.

When they do so they should be re-designed after working out the stresses, and rebuilt to much heavier cross-sections. The main cross-bracket also fails because the bolthole is bored far too close to the end of the cantilever arm; this causes the ends to split and open up. When rebuilding the arm, it should be designed longer and with iron strap reinforcement and of heavier cross-section.

The after-bracket over the turn-table is not strong enough for the strains which are brought to bear, when going over uneven ground, owing to the fact that the pole is fixed. It can be strengthened by cutting it out of limber 6 in. deep, tapering it to the ends, and fixing the short tongue into a mortice in the middle of its depth.



The box requires to have two wooden partitions put across it; the top edge of each partition is grooved to fit two of the driver's carbines lying on the flat and to hold them firm. Leather straps should also be fixed to the sides of the wagon to hold the carbine of the third driver and the rifle of the brakesman.

The bearings (*i.e.* points of contact of support between the wagon and the load) nearly always want altering in the pontoon wagons; wedges of hard timber held by long screws or by iron straps (or by both) should be placed on top of the bearing blocks so as to give

continuous contact between the bottom of the pontoon and the block, and to fit accurately the space between. Pontoons, especially the bow section, are liable to slight distortion and to assume peculiar shapes; each wagon should therefore always carry the same pontoon.

In the case of the trestle wagon these wedges are much larger affairs, especially in the fore-bearing blocks, as the latter are made to fit the lines of the bow of the pontoon and are sloped up considerably. The result is that the baulks and ribands become long and heavily loaded beams, supported at both ends only and without any intermediate supports.

Cart Covers.—All vehicles having cart covers (G.S. or technical wagon, R.E. limbers, tool carts and G.S. limber), should be provided with arched ribs, which are best made of tee iron of small cross-section. The tool cart should have a flat arch, and the open wagons a high semi-circular or elliptical arch. The bridging wagons (especially the pontoon wagons), might also be provided with ribs, and with improvised cart covers (made up out of canvas in the company workshop). The advantages of this arched roofing are:—

(1). Rainwater is thrown off at once, instead of lying about in pools in depressions on the top of the load.

(2). The life of the cart cover is prolonged.

(3). The wagons look smarter and, when together, the column looks more symmetrical and more uniformed.

(4). Best of all—a limit is put to the amount of load which can be heaped upon a wagon, *i.e.* overloading and freak-loading is defeated.

(5). The vehicles, when empty, can be used as bivouacs.

(6). The company and divisional conventional signs can be better painted on both near and off side, and look much nicer when done.

Brakes.—The brake in the bridging wagons should be re-designed and re-made; it is very clumsy, and difficult for the brakesman to get at; the shank is weak and unsupported for too great a length; it soon develops "play," and finishes up with only a small portion of the surface of the brake in action on the tyre of the wheel.

It would be better to have a brake of a totally different type, *i.e.* the pattern on the tool cart, but as this is not easy to arrange, the brake, as it exists, should be stiffened and strengthened by diagonal braces. The brakesman's pack should be carried for him unless the tool cart pattern brake is fitted.

Wheels.—The wheels of the bridging wagons should be replaced by artillery wheels on the first opportunity that occurs.

A Field Company, R.E., on the Line of March.

The average mule supplied to the field companies is a hardy and sure-footed animal and makes an excellent pack animal, but nature never intended it to be a draught animal; it has not the weight, bone, muscle, nor the breadth of chest or of quarters for the purpose.

It often occurs that the greater the number of pairs hitched on to a wagon, the less the result on the movement of the wagon, due partly to the mules (also drivers), not being sufficiently trained, also to some of the mules pulling in different directions and the remainder not pulling at all. It is therefore better to break the double tool carts and drive them singly in order to get the best value out of the mules.

Trouble on the line of march nearly always occurs with the four-wheelers. When this is due to the steepness of the road, or to a short length of bad surface, it is usually better to man the drag ropes; if this fails, then take off part of the load and get over it light.

It should be remembered that a field company, R.E., consists of three parts having different rates of progression on the line of march; namely, the two-wheeled vehicles, which do say 5 miles an hour, the four-wheeled vehicles 4 miles an hour, and the men and pack animals, 3 miles an hour.

The best way to move a field company from one place to another by road, is to march each of these three component parts separately. This gets the best value out of each part, and allows each to move at its natural pace, and is more comfortable for all. It is certainly a mistake to have animals and vehicles sandwiched in between the dismounted sections as in the regulation march formation.

The two-wheelers, with the section vehicles kept together, and in the same order of march as the men, should be started off first, headed by the Assistant Company Adjutant and tailed by the mounted serjeant. The latter helps the Assistant Adjutant to decide (on reaching camp), how the picket lines are to be laid out and the wagons parked. The brakesmen can keep up and go the pace of five miles an hour if their packs are carried for them. The two-wheeler column arrives first in billets, and the cooks at once get to work on the men's meat meal. This enables the men to get their dinners quicker than they would otherwise.

The four-wheelers should start next, headed by the Company Adjutant and tailed by the mounted corporal and farrier-sergeant, and the remainder of the mounted section.

Last of all the four dismounted sections with the four pack animals together, in the rear, headed by the C.O. and tailed by the next senior officer (not with the first two columns). The men march far better if they are all together as a solid mass of men. When the section officers are not riding, their horses should be placed behind the pack animals. This should be done at a halt so as not to break the column on the line of march. In hot or dry weather the water cart can be sent with the four dismounted sections, taking position behind the four pack animals.

Four men for message work (cyclists) go with the two-wheelers (two at the head and two at the tail of the column). Four cyclists

similarly with the dismounted sections. Eleven cyclists (two per dismounted section and two for the headquarters and mounted section, under an N.C.O.) go ahead as billeting party. They take cooking pots and have hot tea ready for the men on arrival. The remaining fourteen cyclists go with the four-wheelers as escort (see para. 4) in case of trouble on the line of march.

Divisional Field Companies, R.E., on the Line of March.

When two or three field companies of a division march together as a formed body of Divisional Field Engineers, a similar formation is adopted, *i.e.*, three separate columns (two-wheelers, four-wheelers, and dismounted men) in the same order of march as the companies. In the two-wheeler column, the first company portion will be headed by the Assistant Company Adjutant and tailed by the mounted sergeant, the last company portion will be headed by the mounted sergeant and tailed by the Assistant Company Adjutant.

The four-wheeler column will be in a similar formation, *i.e.*, headed by the Company Adjutant of the leading company and tailed by the company adjutant of the last company.

The Regimental Medical Officer (M.O., R.E.) comes last of all (behind the men's column) with his N.C.O. orderly and red-cross Maltese cart, also the Chaplain, R.E. These two officers attend to march casualties. The Veterinary Officer, R.E., is also with this party, and attends to march casualties of animals.

C.R.E. and Headquarters, R.E.

The C.R.E.'s and Headquarters, R.E., wagons (two G.S. limbered wagons) are attached to one of the companies (remaining with the same company all the time) and march at the rear of the two-wheelers of that company, accompanied by one of the C.R.E.'s three cyclist orderlies (one borrowed from each company). The whole column is headed by the C.R.E. who has with him his adjutant and regimental sergt.-major, also one cyclist (of his own) and one from each field company, for message work on the line of march, also the C.R.E.'s and adjutant's mounted orderlies. The C.R.E. thus has, for message work on the line of march, four cyclist orderlies and two horse orderlies.

The C.R.E.'s advanced billeting party consists of the Divisional Field Engineer, the Engineer Clerk, one cook, and one of the C.R.E.'s three cyclists. All the above (except the D.F.E.) would be on bicycles; tea is prepared on arrival as previously mentioned.

The French Interpreter, R.E., goes ahead on a bicycle the afternoon before; he allots an area to each field company. The leading company on the line of march gets the furthest area, on the far side of the village (or R.E. area); the rear company gets the nearest billets.

ARRIVAL AT THE END OF THE MARCH.

THE TWO-WHEELER COLUMNS.

About 200 yards before reaching billets the two-wheeler column is halted. The first company portion advances alone, and is met at the entrance to the village by the officer, N.C.O., and five cyclists of its advanced billeting party, the remaining five cyclists being engaged in getting hot tea ready. The R.E. limber of each of the four sections is then pulled out of the column and guided to the section billet by the section guide; the G.S. limber (or cooks' cart) similarly to the Headquarters' and mounted section billet. The articles required for the night are offloaded and the teams are then led away to the horse lines leaving the vehicles with the sections for the night. The five cooks then at once get to work on the men's meat meal.

The water cart (if not with the dismounted sections column, as previously stated) goes to the best drinking water in the neighbourhood and then calls at each cookhouse in turn (seven messes, *e.g.*, officers', sergeants', headquarters' section and mounted section, and four dismounted sections).

The eight single tool carts close up on the road, and are guided to the wagon lines direct.

The Assistant Company Adjutant, with the mounted sergeant, lay out the horse lines and wagon lines, and find out about horse watering places.

As soon as the roads are clear of the first company, which has gone through the village to its billets on the far side, the two-wheelers of the second company advance from the halting place outside the village (in the same way as the leading company) to their billets in the centre of the village.

Similarly the third company moves to billets on the near side of the village directly the second company is clear. When the column arrives at the halting place outside the village the Assistant Company Adjutant of the third company moves up to the head of his two-wheelers, and the mounted sergeant drops back to the rear of the column.

The order of the march in the two-wheeler column of each company is the R.E. limber, then the tool carts of the leading (dismounted) section on the line of march, headed by and under the charge of the mounted N.C.O. of the section, then the two-wheelers of the other three sections in order of march, then the G.S. limber (or cooks' cart) and last of all the water cart (if not with the dismounted sections).

The Officers' Mess cart follows behind the two-wheeler column, keeping a respectful distance from it and trying to look as if it did not belong to it (being a non-regulation or outcast vehicle).

The Four-Wheeler Column.

The four-wheeler column when it approaches in due course of time (it sometimes arrives long after the dismounted sections column) is halted outside the village, in the same way as the two-wheeler column.

The order of march of each company portion is G.S. wagon (or technical wagon), trestle wagon, No. (1) pontoon wagon, and last of all No. (2) pontoon wagon and the spare animals.

On arrival at the above halting place the technical wagon of each company is taken by the headquarters' section guide to company headquarters. The few things required for the night are offloaded and the team goes off to the horse lines.

The bridging section four-wheelers of the leading company go straight to the horse lines from the halting place; directly the first company wagons are parked the second company follows; similarly the third company.

When the third company arrives at the halt outside the village, the Company Adjutant moves up to the head of his company portion and the mounted corporal drops back to the rear.

The Company Adjutant is sent with the four-wheelers and not with the two-wheelers. It would be a good thing if he could move with the latter and arrive first in camp in order to lay out the wagon lines and horse lines, but the Assistant Adjutant can do this well enough with the help of the mounted sergeant; the Company Adjutant is more wanted with the four-wheeler column, as the latter is the only column that is likely to give serious trouble on the line of march. If the country is hilly and the roads have steep gradients or sharp turns or a soft or rough surface, or if they are slippery owing to rain, snow or ice or nature of covering (cobbles, concrete, wood blocks, etc.) or flooded, or if it is dark, then it is no easy matter to get the trestle and two pontoon wagons through the day's march. The technical (or G.S.) wagon very seldom gives any trouble. Indeed the four-wheelers often arrive hours after the remainder of the company, and sometimes they do not arrive at all (until the next day). The line of march should invariably be reconnoitred the day before, if possible, or at any rate by cyclists sent some hours ahead, and previous preparations should be made for tackling the bad parts. These cyclists will also find out all places where horses can be watered during the march, and send back reports about them. It will often be necessary to send the four-wheelers by a totally different road to the rest of the company, in fact the two-wheelers sometimes use one road, the four-wheelers a second and the dismounted section a third road; each column going by the road which suits it best.

THE DISMOUNTED SECTIONS COLUMN.

The dismounted column is halted outside the village at the same halting place as the other columns.

On arrival at this halt the column is met by the guides of the billeting party. The first company then moves forward alone, and when it arrives near its billets, each section is led away separately to its billets by its section guide The men are immediately served with hot tea, which they help out with the remainder of their mid-day feed (or haversack rations), the hot tea having been got ready by the advanced billeting party. After settling down in billets the men have their meat meal, rations having arrived early with the two-wheeler column in the R.E. limber (or forage cart). The section cook either comes on ahead on a bicycle as one of the advanced billeting party or as brakesman to the R.E. limber. Each section officer must remain with his men until he has done everything that is humanly possible to make his men comfortable, and similarly the Company Adjutant remains with his drivers and animals The C.O. looks after the Headquarters' section, and later on goes round all billets.

The section pack animal is offloaded at the section billet, as some of the tools (picks and shovels at any rate) will probably be required for making a latrine, also a refuse pit, and for cutting up wood for the cookhouse, etc.

C.R.E. AND HEADQUARTERS.

The C.R.E. (with his headquarters) should arrive early at the starting point, look down the column and get all the various units in their proper places, leaving 50 yards interval between the three columns. All the three columns start together. The C R.E. then rides ahead shortly before the time of starting, and finds a place by the side of the road about a mile ahead, from which he can get a good view of the column ; a bend in the road or the bottom of a long straight down slope is the best place to stand. At the first inspection on the line of march the C.R.E. takes the near side of the column and the Adjutant the offside ; at the next inspection the C.R.E. and Adjutant change sides. The O.C. of each company column falls out in the usual way after saluting and remains by the side of the C.R.E., who points out anything not up to standard as regards march discipline, turn-out of men, animals and wagons, saluting, etc., fitting of harness, loading and balancing of wagons, etc. The C.R.E. points these out also to the O.C. of the company when he joins C.R.E. later from the head of the dismounted column. Each column in turn salutes the C.R.E. once only on the line of march, at his first inspection, each company portion saluting separately. After that the officers only salute.

The column takes about 14 minutes to go by. When it has passed, the Adjutant reports to the C.R.E. anything he has noticed wrong on the other side of the column.

The C.R.E. sees the column go by again about half-way through the march. He then goes on ahead so as to reach billets well before the leading column of two-wheelers. He is met by the Interpreter, R.E., who shows him roughly the area allotted to each field company, the position of the horse lines, Officers' Mess, and orderly room of each company, also of headquarters. The C.R.E. inspects any of these he is doubtful about, and inquires about water for both men and horses. It is sometimes necessary for him to make alterations. The important thing is that the first company on the line of march should be allotted billets on the far side of the area (*i.e.* should march right through the area to the other side) and the last company billets on the nearest side of the village. The C.R.E. should have a good Officers' Mess as he may have to offer hospitality to the G.O.C. or to senior officers of the division. He should also have a good office as he may be visited by the above officers, also by the Chief Engineer; and he may want to have conferences of his company commanders. In addition he usually has a lot of office work to do.

The notes made by the C.R.E. and his adjutant on the line of march are either sent out to each company, or the C.R.E. discusses them with his three company commanders at a conference—the same evening. At the same time the C.R.E. discusses the next day's march, the starting point, and best places for halting the men (both short and long halts) and for watering animals, steep gradients, and any bad places on the road where there is likely to be trouble with the four-wheelers. When the march is a short one engineering reconnaissances, exercises and schemes (such as destruction and reconstruction of bridges, roads, water supplies, and observation posts, defence of villages, etc.) can be done *en route*.

March Comforts.

Each section should have the following:—

(1). A nest of five tin ablution basins, with square corners, packing one inside the other. These can be made in company workshops from old ration tins. A light portable fold-up wooden bench can be made for these basins. An ablution bench of this kind enables the men to have a comfortable and good wash immediately on arrival in camp.

(2). A "Dixie trough," *i.e.* an inverted trough of this cross section  made of light sheet iron, and with holes into which the section dixies fit, as low down as possible, *i.e.* with only the handle rings showing above. This results in the men getting much better value out of their fuel, in great saving of fuel and in

cleaner and more sanitary cooking. Better draught, quicker cooking and greater fuel economy are obtained by having two sections using the same cookhouse and joining two troughs together and making them into one. If a chimney or stove pipe can be improvised, fuel need only be put in and burned in a short length of one end of the trough.

(3). For a time I also tried carrying a light portable folding wooden box latrine seat of the flyproof type, and a light folding canvas screen to go round it, at the rate of two per section, but I gave it up because of its being (on the box seat of the fore wagon of the R.E. limber), so near to the meat and rations in the rear wagon of the same vehicle. But there is no objection to it if some disinfectant is carried with it and the box well cleaned and disinfected before being loaded up. It certainly is a comfort to the men, and a good thing from the sanitary point of view. Men are more likely to use a latrine if it is a comfortable and clean one, and by this means they can have the latter within a short time of arriving in camp.

(4). The mounted section should have two small horse troughs about 6 ft. long each of this cross-section __/, made of sheet iron, and to pack one inside the other; four light wooden portable trestles should be made to mount the troughs on. The hand pumps in the company equipment are used for filling these troughs, which are a comfort to the horses and enable them to be watered quickly and cleanly both on the line of march and immediately on arrival in camp. They are a protection against diseases which are sometimes picked up in publichouse water troughs.

The troughs can also be used as mangers, especially for savage feeders, *i.e.* for the type of animal that considers nosebags and haynets as part of the menu.

It may be remarked, *en passant*, that manger feeding should always be arranged if possible, and mangers should be built if the company is staying any length of time in one place or if the horse lines are likely to be used by other units subsequently. Without mangers a considerable portion of the feed is wasted, especially with mules.

If a company is staying more than one night the following should be made: (1). An oven, out of oil drums. (2). An incinerator for burning camp refuse.

If transport is available a small portable boiler is a useful thing to have. It is useful on the line of march, also for giving men hot tea for their midday feed (or haversack ration) when on works. Hot tea on works at half shift time should always be arranged if possible, especially on night work, as it is a great help to the men, keeps them warm and fit and increases the output of work during the second half-shift.

Tool Cart, R.E.

The packing of the tool cart is a much discussed and vexed question. It is probably the heaviest load in the Army weighing 1,022 lbs. per animal, and its correct balancing is important. One method of packing is to put all the most frequently used tools (wood-working and a few metal-working) into one cart, and the less frequently-used tools into the other. The latter can then be put on one side.

If the company is likely to be suddenly called upon to turn out a small detachment (half a section) for isolated work, it is better to pack both carts exactly the same way, so that one can be sent off at once with a pair of horses, the most frequently-wanted tools being packed where they can be most easily and quickly got at.

Each section should have the tools, etc., carried outside the tool cart arranged in the same way, for the sake of symmetry and uniformity on the line of march.

Pack Animals.

A small wooden box should be made to carry the guncotton slabs. The box should be made narrow so as to lie at the bottom of the leather saddle bag.

Trestle Wagon.

Two small wooden boxes should be made to carry the differential tackle, to keep it clean and to enable it to be easily found.

The mounted section should have :—

(1). Horse water troughs (as already stated).

(2). Eight picket line posts. These posts are for three picket lines —one line for section horses, a second line for headquarters' section horses, and a third line for officers' chargers, horse hospital and for bad characters (kickers, etc.). The posts should be made of 4 in. × 4 in. deal, the square corners bevelled off, the post then covered with small mesh expanded metal, and the edges pinched into a vertical groove in the post. The top of the post is bound with flat iron or plain wire, to prevent fraying when it is being mauled into the ground, and the bottom pointed (chisel point) and shod with iron. A hole is bored horizontally through the top of the post to take the picket line, which should be of thin wire cable or two or three-strand plain wire.

When finished the post is tarred over. Picket lines should never be made fast to any of the company vehicles, or to live trees, as mules will ruin both in a very short time.

These posts enable the horses to be tied up in neat and regular lines immediately on reaching camp.

The wagons should also be packed in neat, straight and regular lines ; two-wheelers in one part of two lines, the two-wheelers (*i.e.*

the eight single tool carts) in two or four lines according to the ground, and the four-wheelers (*i.e.* the three bridging wagons) in one line, the remainder of the company vehicles being in billets with their sections. Each wagon should be driven right on to its position in park—it should not be necessary to alter it later. Soft ground must be avoided for the bridging wagons; otherwise they will sink in during the night and cause trouble and delay when starting next morning. If firm ground is not available for the bridging wagons, they should be packed on the side of the road.

On arrival in camp all vehicles must be washed clean, bearings greased by the brakesmen, and all inspected by the company wheeler, also by section officers, any damage done to be reported at once to the O.C. and all march casualties (to men, horses or vehicles) together with hour of arrival and address of company headquarters (for messages) should be reported as soon as possible to the C.R E.

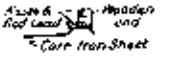
In order to look well on the line of march each column should arrive early at the starting point. The officer in charge should then go along the column and tidy up any men, horses or vehicles that require it, especially those horses which are in the habit of rolling in the mud after being groomed.

HORSE WATER TROUGH.

By LIEUT.-COLONEL A. A. CROOKSHANK, R.E.

If sheet iron is not available the trough can be made of corrugated iron rolled out flat in a machine or beaten out flat with mallets. This labour is justified, as the flat sheet gives larger water capacity and better joints at both ends of the sheet.

The two longitudinal 4-in. × 1-in. timbers act as longitudinal braces and also prevent animals from getting their feet into the central drain (surface water) or from bumping into the sides of the trough. The joint between sheets should be fitted with waste steeped in red lead. The joint between the iron sheet and the wooden end should be as sketch, *i.e.* chase cut in board to be filled in with waste (steeped in red lead). Interior of metal trough should be painted white; exterior to be tarred. The following also are tarred:—(1). The top horizontal rails. (2). All woodwork below ground level and up to 9 in. above ground level. The top horizontal rails to have plain wire stapled to the upper surface also to the outsides as a protection against animals' teeth.



The drain under the trough can be made of old corrugated iron, fascine, or old planking.

On both sides of the trough, standing to be sloped down to central drain at 1 in 25, and floored with outside cuts of circular logs carried on bearers or biscuits of reinforced concrete, or brick on edge laid dry, or chalk covered with sand or coke, etc. If made of brick on edge or concrete slabs the floor to be broken up into squares or rectangles by a wooden framework thus :—

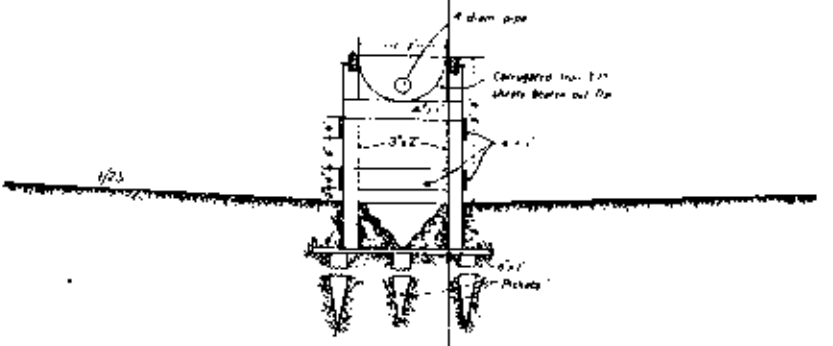
The flooring must be made at least 10 ft. wide and a cattle fence 4 ft. high put up outside it. Openings to be left in continuation of the trough.

The standard size of trough will be a unit of two 7-ft. sheets; this being a convenient length for handling and for loading into a G.S. wagon, etc.

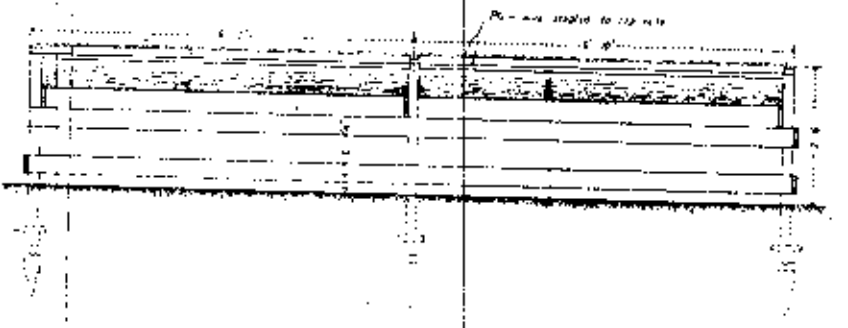
In places likely to be semi-permanent or permanent, the troughs can be joined together and built continuous (to full cross-section) in lengths of four, six or eight sheets. On temporary sites the trough

can be erected in standard units (two 7-ft. sheets long) connected by short lengths of 4-in. piping.

For close packing on vehicles the trough should be made up in three packages. (1). The trough only. (2). The four longitudinal braces of (4 in. × 1 in.) timber. (3). The three trestles. When making up into long continuous lengths (of full cross-section) the joints between the standard (two-sheet length) troughs should be made with gutter bolts. This enables the trough to be easily taken to pieces and re-erected elsewhere.



CROSS SECTION THRO. A.A.



ELEVATION.

MORSE CODE DIAGRAM.

By MAJOR A. D. ST. G. BREMNER, M.C., R.E.

THE diagram on next page was found recently in a Swiss handbook on the Prismatic Compass. It is believed to be an original method of presenting Morse Code signals in a graphical form and is quite ingenious. The diagram is apparently intended to make it easy for the uninitiated person to decipher the letters as they appear on the tape of the inker, but not *vice versâ*.

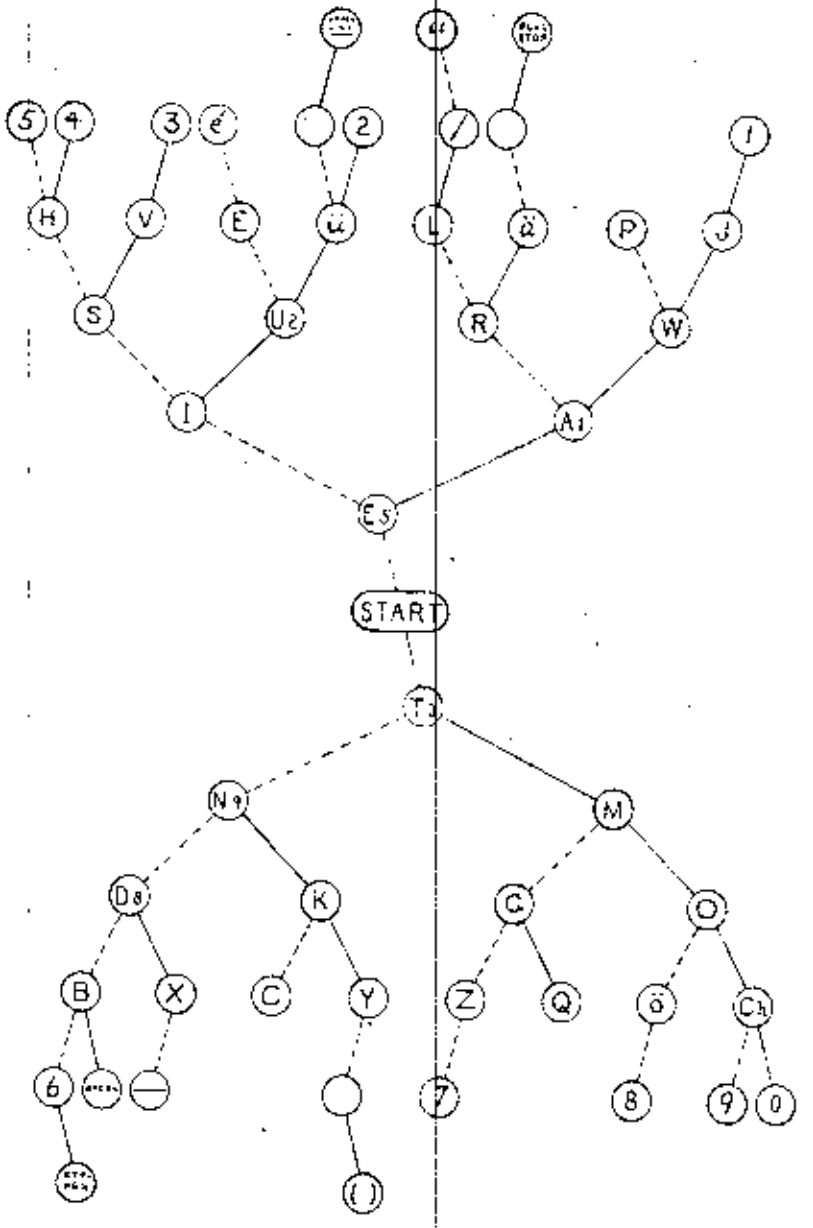
To use the diagram, suppose it is required to know what letter corresponds to the signal . · · — Dots are represented by the dotted lines and dashes by the full lines. Commence at "Start" and as the first part of the signal in question is a dot, proceed upwards to E5 (as shown in circle on diagram), then for a dash proceed to the right through A1 (as shown in circle on diagram), and another dash gives the letter W as the answer. Similarly, for signal —·— . proceed from "Start" to TO (as shown in circle on diagram), then to M (as shown in circle on diagram), and on to G as the answer.

Where both a letter and a figure appear in a circle together, the figure is of course the "short" numeral.

Another practical use is suggested and that is by issuing the diagram in blank, *i.e.*, without letters and figures inside the circles, the diagram could be made into the key of a cipher at any time by inserting the cipher letters and figures in their proper circle according to the signals representing them. Then the message as received could be decoded by an officer directly off the tape by means of the diagram. This might perhaps save some time according to circumstances.

Another advantage is that if other signs such as commas, or semicolons, etc., required insertion in the signal code, it is easy to invent the necessary signal by adding a circle in the obvious blanks on the penultimate top or bottom lines or even beyond these and joining them to the nearest lettered or figured circle on the next line by a full or dotted line as the case may be. In this connection it will be noticed that on the diagram, dashes are always drawn to the right and dots to the left.

Finally, the diagram might assist a beginner in learning the Morse Code.



MORSE CODE DIAGRAM.

CEMENT JOINTS FOR CAST-IRON WATER MAINS.

MR. H. SHAW recently read a paper before the American Society of Civil Engineers, and we have been asked to reproduce the extracts below.

About 1886 a cast-iron pipe line for water distribution was laid with cement joints at Redlands, Cal., and in 1891 joints of that kind were used at Los Angeles, Cal., but evidently with questionable results, as the method was not adopted. In January, 1907, Mr. Charles Thornburg, then superintendent of one of the water companies operating in Long Beach, Cal., decided to try cement joints for a 16-in. cast-iron pumping main, and instructed his foreman of construction, Mr. F. M. Shrode, to conduct some experiments.

No definite process was outlined to the foreman, but his experiments and practice in repairing steel riveted water mains, under pressure, by using a dry mixture of neat cement in caulking the bands around these pipes, gave him an idea that a moist cement could be caulked into the bell solidly, and would produce the results desired. It was probably Mr. Shrode who, by this experiment, finally perfected the joint and used it in the construction of the entire line. When this line was completed and put into service, working under a static head of about 190 ft., several places showed some seepage, particularly at the lower end of the line, where the work was started, and it was decided to re-caulk these joints at the first opportunity; it was noticed, however, that the moisture was gradually drying up, and the seepage finally ceased.

Cast-iron construction was then abandoned by the company until 1911. During that year the works came into the possession of the municipality, and Mr. Shaw was appointed Engineer of the Water Department. After looking into the merits of the cement joint, as used on this 16-in. pumping main, it was adopted as the proper method of construction, and since that time it has been used throughout the entire system.

Long Beach now has 60 miles of cast-iron water mains, ranging from 4 in. to 24 in. in diameter, laid with joints of this type. All these pipes are under pressures ranging from 40 lbs. to 80 lbs. per square in., and are giving perfect satisfaction.

In making the cement joint the pipe is placed and spaced in the usual manner. A thin backing of the best dry jute is used instead of oakum, as the jute is free from oils and grease, which should be avoided. A Portland cement, conforming to the specifications

advocated by the American Society for Testing Materials, is used. The dry cement is placed on a piece of canvas, usually a cement sack ripped open, and moistened with just so much water that when thoroughly mixed by hand the mixture will be of such a consistency that when gripped tight it will hold the form of the hand, and when dropped 12 in. it will crumble. The canvas containing the cement is placed under the bell, and the cement is tamped into place by hand with a caulking iron until the bell is about half full. It is then caulked with heavy blows until the cement is thoroughly packed in the back of the socket. This process is continued until the bell is packed solid out to the face. A small beading of neat cement in a plastic condition is then put round the whole joint, using the caulking iron as a trowel. As soon as the initial set of the cement in the beading has taken place, the joint is covered with earth to protect it from the air and sun. In back-filling, the excavated material is always settled with water, which helps to cure the exposed portion of the joint.

The beading is essential, in Mr. Shaw's opinion, as the cement packed in the bell is so dry that, without protection, it would absorb moisture from the water used in settling the trench, and he believes that, should the joint develop seepage when the pressure is put on in the main, the cement, being dry, would expand and aid materially in keeping the joint tight.

Experiments on cement joints constructed without the beading showed that 24 hours after completion they absorbed water readily. In cases where seepage has developed and has subsequently closed, it is assumed that the dry cement absorbed the moisture from the inside, expanded, and filled the seepage pores.

About 20 per cent. of the cement is wasted by falling off the canvas or being thrown out by the caulker. If any dust or earth from the trench falls on the canvas or in the cement, it is immediately taken out, together with enough cement to make sure that the remainder is clean. In mixing the cement with water, care is taken that there shall be no lumps in the material, no matter how small. If any cement is left on the canvas when the joint is completed, it is used on the next joint, provided the work is continuous, otherwise new batches are made. Special blunt caulking tools are used.

The joint is allowed to stand 48 hours before the pressure is turned on and the main is put into regular service. Cement joints have been used with satisfactory results, however, twelve hours after completion, but this is not considered safe practice. Pressure tests are never made by Mr. Shaw prior to putting a main into service.

At San Diego, Cal., a pressure test was made by caulking a 6-in. cast-iron tee, one side of the tee being filled with a plug and each of the two ends filled with short lengths of cast-iron pipe with plugs caulked in the ends. As the pieces of pipe caulked in the tee were scrap ends cut from other pipes, they had no bead on the joint end,

and, notwithstanding the fact that the joint was made with smooth pipe, it took a pressure of more than 300 lbs. per square in. to force the pipe out. The test was made about 48 hours after the joint was made.

In another test, made at Winnipeg, Man., three lengths of 6-in. pipe were laid with four cement joints, on January 13th, 1916. After six days pressure was put on the pipe in increments of 25 lbs., and the joints were found to show no leakage or moisture up to 125 lbs. At 150 lbs. one joint showed moisture on the surface of the cement.

On January 24th another test was made, and at one joint moisture appeared at 175 lbs. On January 31st this joint showed moisture with 200 lbs., and also on March 15th, with a pressure of 255 lbs. This joint was the weakest of the four. The pressure was kept on the pipe about one half-hour in each case.

The strength and rigidity of the cement joint are shown by the following instances where cast-iron mains have been subjected to severe tests:— A new trenching machine was being tested by a sewer contractor in Long Beach, Cal. It operated parallel with and 5 ft. from a 6-in. cast-iron water main, with cement joints, which had been laid in January, 1915. The trench dug by this machine was 3 ft. wide and 18 ft. deep. Some time before noon on February 1st, 1915, the side of the trench next to the water main caved in, leaving about 40 ft. of the pipe hanging and supporting about 2½ ft. of earth on top of it. This condition was not reported until the next morning, and at 9 o'clock braces were put in to support the pipe. The main was under a pressure of about 65 lbs. per square in. at the time. There was not the slightest seepage from any of the joints as result of this strain.

Again, in June, 1915, 94 ft. of 4-in. cast-iron pipe with cement joints fell into a sewer trench, as the result of a cave-in under conditions similar to those just described. This pipe was under a pressure of about 55 lbs. per square in. At one end it broke at a service connection; at the other end it broke near the spigot end of a pipe, about 8 in. from the joint, letting the whole 94-ft. section fall into the trench. In this case every cement joint remained intact. This line had been laid in March, 1913.

Several thousand feet of 8-in. and 10-in. cast-iron water mains with cement joints have been laid in made ground, the filling-in material being silt from the dredging of harbour channels; also several thousand feet of 8-in. cast-iron pipe have been laid in fine beach sand; all are giving perfect satisfaction. An 8-in. cast-iron main with cement joints was laid in filled ground—the soil being clay—with only 6 in. of covering above the pipe when the line was put in service; the fill was then completed to 18 in. above the top of the pipe, and was rolled with a 14-ton steam road roller, without causing

the slightest seepage in any of the joints. The rolling was done preparatory to paving the street in which the pipe was laid. This was a very severe test of the merits of the cement joint. At the time this rolling was done, had any seepage developed, it would have been readily detected, as the whole line was within 3 ft. of the edge of the fill. The fill was completed to a width of 80 ft., three months later, leaving the pipe 12 ft. from the centre of the street.

In several instances a cast-iron main laid with cement joints has settled 3 in., or probably more, in loose or filled ground, without developing any leakage. In fact, Mr. Shaw has only experienced one case in which the cement joint was not satisfactory. That was in a 6-in. cast-iron main in a dock, about 3 ft. from a railway line. Many joints in that pipe developed seepage, and some had small pin leaks, but the leakage was not considered serious enough to warrant closing down the line for reconstruction. This failure may be due, Mr. Shaw considered, to faulty construction, as the pipe was laid when the making of cement joints was in its infancy.

COLONEL SIR COLIN CAMPBELL SCOTT-MONCRIEFF
KCMG, KCSI RE

General) Brownlow, R.E., as his Superintending Engineer. Colonel Western, R.E., who in later years followed Moncrieff to Egypt, was one of his assistants at this time.

Brownlow and Moncrieff were kindred spirits and became fast friends. They worked together most energetically and successfully for the good of India and its inhabitants. About this time irrigation had passed under a cloud. It was accused of not paying its way and of being an unprofitable servant to the State, even when it had done that which it was its duty to do. Through the combined efforts of Brownlow and Moncrieff the charge was disproved by the result of their labours, and the tide of public opinion in respect of irrigation was turned in its favour.

In 1867 Moncrieff took furlough, during which he examined on the spot the irrigation systems and administration of France, Spain and Italy, and, for result, published his book, *Irrigation in Southern Europe*, 1868—a work which made his name prominent among irrigation engineers.

On his return to India in 1869 he succeeded General Brownlow as Superintending Engineer of the Ganges Canal. The fact that he was chosen to fill a post of such importance, when as yet he was only 33 years old, shows that his superiors had already marked him as one fit for positions of great responsibility. To be in charge of such a division—300 miles in length from Hardwar to Cawnpore—was a grand experience for an intelligent and keen irrigation engineer. The Ganges Canal was a great object lesson to the irrigation world. The main canal works had been so designed and constructed that too high a velocity of flow was the result, and dangerous scour was consequently produced below the falls, threatening their stability. Drainage also had been neglected in the original scheme with baneful results. To remedy the defects on the main canal the falls had been remodelled in part before Moncrieff took charge, but he had to complete the remodelling of the remainder. He had also to correct the defects in alignment of the distributaries and elaborate the drainage system on sound lines. Perhaps no lessons are so instructive and convincing as those taught by the results of mistakes made by the student himself or by others.

Moncrieff had been for seven or eight years in charge of the Northern Division of the Ganges Canal when he was called away to other work. There was severe famine in Madras. There had been mismanagement in dealing with it, and, in consequence, a change of administration was decided on. Two Famine Commissioners were appointed—Sir Charles Elliot (afterwards Lieut.-Governor of Bengal) and Moncrieff. The former was charged with revenue questions and the administration of hospitals and camps where the people were fed; the latter was told off to devising and supervising the Famine Relief Works on which the needy were employed at a living

wage, whatever their powers of work might be. The Special Commissioners had superseded senior men on the spot, so that a situation demanding the utmost tact was produced. Their work, moreover, was strenuous, it was spread over a wide tract of country, and much of it was of a distressing nature. But both men had their hearts in the work—hearts which sympathized with the suffering, the starving and the sick who had been entrusted to their care. The anxiety, responsibility and strain thrown upon the Commissioners was great. They laboured without ceasing amidst scenes of starvation, cholera, small-pox and other ills for two long years, until, at length, the angel that destroyed put up his sword again into the sheath thereof and the woe was past. The C.S.I. that was bestowed on Moncrieff as a recognition of his good work as Famine Commissioner was an honour fully earned.

In 1879 he resumed his work on the Ganges Canal, and then went on furlough for two years. On his return to India in 1881 he was made Chief Engineer of Burma. His work there was of a general nature, roads, public buildings, harbour works, lighthouses, etc. He retired at the end of 1882 and took passage for home early in 1883. But he failed to make the home port. Lord Dufferin, being well served by his Intelligence Department, waylaid him at Suez and captured him for Egypt.

Egypt was at a crisis in its history. In Nubar Pasha's words, Irrigation was the "Egyptian Question." To choose the right man to harness the Nile and handle the reins was therefore a matter of the utmost importance to Egypt. The fact that the choice fell upon Moncrieff shows what his chiefs thought of him and his works. He was not known to fame as the builder or designer of any prominent work of construction, such, for example, as the Solani aqueduct or any of the large weirs of India's rivers; nor was his name connected with the initiation of any large irrigation project or sensational engineering work such as are the subject of newspaper articles that the public reads. But his work had been honest and thorough, his administration tactful and human, and his attitude towards the people of India patient and sympathetic. His subordinates knew him and called him an ideal chief. His chiefs knew him—knew him as an engineer to be relied upon and a man to be trusted. His work in Egypt has since shown how well they judged—or how well they were guided by a wisdom greater than their own—when they advised Lord Dufferin to secure him.

It was in May, 1883, that Moncrieff took charge of the irrigation of Egypt. He was at once confronted with the question of the system to be adopted for the irrigation of Lower Egypt. The expert advisers of the Egyptian Government had pronounced the Delta Barrage to be a hopeless and irredeemable failure, and had drawn up a project for the irrigation of the Delta by means of a huge system

of pumping stations. Moncrieff wisely refused to accept the condemnation of the Barrage as final, or to express an opinion on the pumping project as an alternative, until after he had made himself acquainted with the existing state of affairs by travelling about the country during the summer of 1883. Meantime he gathered to himself from India his staff of assistants, of whom one of the first to arrive was Mr. (now Sir William) Willcocks. Moncrieff and Willcocks then—in 1884—commenced to study the Barrage and diagnose the weakness which was rendering it unfit for service. They discussed it and tested it. They took liberties with it and noted results. In 1885 they took more liberties without incurring the disaster their critics prophesied, but, on the contrary, securing much benefit to the cotton crop. They had proved that, with merely temporary expedients, the Barrage could be made to hold up water to an extent that hitherto had been assumed impossible. It was, therefore, decided to attempt a thorough and permanent restoration in order that the work might hold up a serviceable head of water. So the pumping project became a "wash-out," and not the Barrage. A loan of a million pounds was obtained for works of irrigation, of which the restoration of the Barrage, being by far the most important, was allotted the greater part.

The Delta Barrage—of French design and construction—is made up of twin regulators, one astride of either branch where the Nile at the apex of the Delta divides into the Rosetta and Damietta Branches. It was designed to raise the water level in the river to the height required to feed the main canals of the Delta taking off above it. It failed to do this when the attempt was made, because the foundation concrete had been recklessly laid in running water, and consequently the mortar, which should have compacted the floor and made it water-tight, was washed away. Hence, as soon as any head of water was produced by regulation of the waterway, the water found its way through the unfilled interstices of the concrete metal, and produced a scour of the river bed threatening to undermine the structure.

The permanent restoration work was entrusted to Colonel J. H. Western, R.E., with Mr. A. G. W. Reid as Resident Engineer. Together they made a most successful job of a difficult piece of work extending over five years. The best evidence of its success is the fact that the Barrage to-day—28 years later—is still doing its duty efficiently. It is the most important work in Egypt, not even excepting the Aswân Dam, as it controls the whole of the irrigation of the Delta. Moncrieff's bold decision to restore it has enriched Egypt to an extent that, if stated in figures, would seem incredible. It was while this work was in hand that Moncrieff received his K.C.M.G., and was henceforth known as Sir Colin, as he will be called in the remainder of this Memoir.

During the same period of work on the Barrage, less ambitious reforms were being effected throughout Egypt by Sir Colin's staff of English Inspectors of Irrigation. Of defects, which it was their task to rectify, there was no want anywhere throughout the irrigation systems of Upper and Lower Egypt. The want in these early days was not work to do, but money to do it with. There was not enough to pay for even the absolutely necessary repairs and alterations, and to prevent things going from bad to worse. The country was on the verge of bankruptcy. But one thing—and that a matter of supreme importance—could be taken in hand without money, namely, the just distribution of water to rich and poor alike. The difficulties experienced, however, in this endeavour revealed the general chaos of the Irrigation Service. But it was because things were as bad as they could be that Sir Colin reckoned himself peculiarly fortunate. This is how, in later years, he described "the state of Egyptian irrigation when Arabis' revolt took place in 1882. The whole country was groaning under its burdens. The rich even were feeling the pressure, for the taxation was heavy, cotton had gone down in price, water was more difficult to get. Happy the reformer who steps in just when things are at their worst, when the people have lost hope of helping themselves. Happy the reformer that has a Governor or Government behind him with a backbone, and a will, and that sees he is left to carry out his views. Such happiness, such very unusual good fortune, fell to the lot of myself and the band of my Anglo-Indian fellow workers."

The backing he had from his chiefs he gave in like manner to those of whom he was the chief. Here again are his own words referring to those under him. "My function has been merely to fight their battles at headquarters, and to back them up through thick and thin, and insist that they were always right—in short to keep the wheels oiled." This is an example of how unassuming men of real merit book back seats for themselves. It may recall to those who heard it Lord Cromer's account of his own share of British influence in the government of Egypt. He likened himself to the man with the horn on the back of the coach, who makes the noise, while the horses—the British officials in the Government of Egypt—are doing all the work. It would have been a truer simile if he had made himself the coachman with the reins and the whip in his hand. The same simile would have been as true of Sir Colin, but without the whip: for he wanted no whip; his team were all free goers.

But Sir Colin's function according to his own account was to be the Department's champion at headquarters and general lubricator. Though in his modesty he belittled his function, it nevertheless required a combination of rare qualities and a great deal more than engineering talent. Such qualities he had in full measure. Firstly, he had broad views. As was remarked of him by one who had

worked as it actually was with abuses to which it readily lent itself, it was an "abomination to the Lord." Sir Colin, as engineer and philanthropist, declared war against this evil thing. But there were many obstacles, financial and political, to overcome. The Native Governors of Provinces were against a change which would, or might, diminish their influence over the people; the Great Powers of Europe for various reasons opposed the reform; till, at length, Sir Colin felt that he could kick against the pricks no longer. Lord Cromer reveals in *Modern Egypt* that Sir Colin, though not easily provoked, was so maddened by the opposition he encountered at every turn that he resigned his post. The limits of long-suffering had been reached.

The difficulty was to find the money necessary to make it possible to substitute paid dredging and contract work for the unpaid labour of the Corvée. That this difficulty was ultimately got over was due to the results of the work done by the department itself over which Sir Colin presided. The chief of the works producing these results was the restoration of the Barrage. The raising of the river water level had made it unnecessary to clear the beds of canals to the depths to which the Corvée had been called upon to clear them, and so the quantity of work to be executed was much reduced. Decrease of silt deposits had also been brought about by a scientific regulation of discharges and flow in various canals. Further, useless work which, through ignorance of what was really necessary in irrigation work, had been included in Corvée programmes, was eliminated. Moreover, the reforms introduced in the service of irrigation had been so effective in promoting general prosperity, that the financial situation was vastly improved, and money for public works was more easily obtainable. It had been estimated that with a sum of £400,000 it would be possible to do all the Corvée work by paid and free labour, and Sir Colin assumed the responsibility of undertaking to do it for that sum. At first £250,000 only could be secured, and with the help of that amount the country was relieved of more than half the burden. At what stage of the negotiations Sir Colin resigned is unknown. But he had not been seeking his own, he had been striving for others, and for their sakes he allowed himself to be persuaded to endure till the end. And so he withdrew his resignation. Ultimately, after tedious negotiations, the full sum of £400,000 was obtained. The victory was won at last and the Corvée lay dead.

The restoration of the Barrage and the abolition of the Corvée were Sir Colin's most notable achievements in Egypt. But the organization of the Irrigation Department on sound lines must be reckoned high among the things that he accomplished; for its results have been lasting and cumulative and still continue to develop. Of other less conspicuous but essential works there were many due to his controlling authority. During his time the drainage of Lower

Egypt, which had been neglected or ignored, was taken vigorously in hand; a project for connecting the villages by agricultural roads was successfully undertaken, no roads of any sort existing before; the basin systems of Upper Egypt were remodelled on scientific principles; and countless restorations, renewals and repairs were effected everywhere throughout Egypt. As a consequence of all these measures and works of reform, the Irrigation Department, working under Sir Colin's direction, had, in a few years, been so successful in its endeavours that every drop of water in the Nile during the low season was utilized in irrigation, and there was none that ran to waste into the sea.

Notwithstanding this, the demand was not met and more water was wanted; the cropped area had increased as fast as more water was made available. So, in anticipation of the eventual removal of the financial and political difficulties which in those days stood in the way of all progress, Sir Colin appointed Sir William Willcocks to conduct the preliminary studies for a reservoir project, the ultimate outcome of which was the Aswân Dam.

In 1890, while still in the Egyptian service, Sir Colin, at the request of the Russian Government, went to Central Asia to give advice about the irrigation of Merv from the Murghab River. In 1892 he retired from the Egyptian service. From 1892 to 1902 he was Under Secretary for Scotland. In 1901 he was selected chairman of the Indian Irrigation Commission, and as such visited India during two successive winters. This may be looked upon as the final act of his irrigation career. In recognition of the valuable service rendered to the Government of India on this Commission he was awarded the K.C.S.I. Thus, after 45 years of good and faithful service to the State and to the people in India, Egypt and at home, he retired at last from work, full of honour, and, better far than that, sure of having won for himself the Master's satisfied: "Well done."

HANBURY BROWN.

REVIEW.

PAGES D'HISTOIRE, 1914—1917.

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The 132nd, 133rd and 134th numbers of this series will be dealt with in our next number.

HISTORY OF THE RUSSIAN REVOLUTION.

The 135th number is entitled *Histoire de la Révolution Russe* (1905—1917) and deals with a subject which is engrossing public attention to such an extent as to justify precedence being given to its issue from the Press.

The contents of the volume are arranged in 39 short sections and it is stated by the editors that French, Swiss, English and American newspapers and periodicals, and more particularly *Darkest Russia*, 1912—1914, have been drawn upon for the materials for the story told in the volume.

I. The story begins with the accession, on the 1st November, 1894, of Nicholas II. to the throne of All the Russias. On his advent to power, it had been hoped that a liberal and progressive *régime* would succeed the brutal reactionary rule for which his father was responsible during the thirteen years preceding the date mentioned above; but the trend of events soon brought disillusionment to the Russian people. Nicholas was well intentioned and had the welfare of Russia at heart, but he wished his subjects to be beholden to him alone for any amelioration in their lot that might be vouchsafed them.

The Czar's intentions were announced, without any circumvention, on the 30th January, 1895, when he addressed a deputation from the *zemstvos* which had waited upon him to offer their dutiful and humble congratulations on the occasion of His Imperial Majesty's marriage, in the previous November, to Princess Alice of Hesse; "an autocratic *régime*, he announced, was to be continued as in the preceding reign. The *zemstvos* saw their hopes regarding the introduction of a Constitutional form of government relegated to the limbo of idle dreams.

Russians were grateful to their ruler for all he did to maintain the Franco-Russian Alliance and also for the steps taken by him which resulted in the assembly of the first International Peace Conference at The Hague in 1899, but Russian Liberals were profoundly disturbed by the unfortunate policy initiated by him in the summer of 1898 in Asia, which led to the rupture with Japan; by the violent measures adopted for the Russification of Finland, the Baltic Provinces and Poland (1899—1903); by the massacres of Jews, in 1903, at Kishinev and at

Homel; and finally, by the cruel treatment meted out to the peasants, which led to the outbreaks of 1902—1903.

II. The diplomatic tension which had long existed between Russia and Japan led, on the 6th February, 1904, to the declaration of War by the latter. The Treaty of Portsmouth (5th September, 1905) brought this conflict, so ruinous to Russian prestige and interests in China, to an end. Although, under all the circumstances, the humiliation suffered by Russia cannot be considered to have been excessive, yet the defeat suffered by the Russian arms was keenly felt throughout the Empire and gave rise to violent excesses, which led to pitiless repressive measures being taken by the government for the purpose of restoring order.

A widespread desire prevailed in Russia to apply some measure of popular control over the bureaucracy, to whom the disasters being experienced by the Empire were rightly attributed. The idea was not a novel one, even in Russia; on many occasions in the XVII. Century Assemblies had been called together to deal with national questions of importance. However Nicholas II. and his advisers were obdurate, in spite of the general unrest and the assassination, in 1904, of Bobrinov, the Governor of Finland, and of Plehve, Minister for the Interior, events which ought to have convinced them that concessions acceptable to the people were urgently needed.

III. Plehve was succeeded by Prince Sviatopolk Mirsky, a man possessing a benevolent disposition and liberal ideas. In November, 1904, the police permitted a private meeting of delegates from the *zemstvos* and municipalities to be held in Petrograd. At this meeting a resolution was passed calling on the Czar to create an elective Parliament, to grant equality of citizenship to all his subjects alike and to guarantee their personal liberty. Mirsky was favourably disposed to the proposals contained in the resolution in question; but, acting under the influence of the Grand Duke Serge and others, particularly of Pobedonostzev, the fanatical Procurator of the Holy Synod, the Czar met these demands by the issue of an ukase (25th December, 1904) announcing a few relatively unimportant reforms only in order to satisfy the labour group and the peasantry, and, at the same time, carefully avoided all reference to Constitutional Reform. The Czar's act increased the exasperation of the masses; the *zemstvos* of Moscow and of Tchenigov adjourned *sine die* and, in doing so, announced that the ukase of the 25th December did not meet the requirements of the situation. On the 2nd January, 1905, Russia learnt with consternation the news of the fall of Port Arthur. Prince Troubetskoi, President of the *zemstvos* of Moscow, now addressed an open letter to the Minister for the Interior, informing him that Russia was on the brink of a revolution and that the grant of complete liberty to the people would alone save the country from the impending disaster. Mirsky, who was not prepared to go to extremes in opposing the popular demands, resigned office and was replaced by Bouliguine, a man who was unknown to the public.

A strike on a great scale, 100,000 workpeople being involved, was organized by the Central Council of the combined Trade Unions; the

workers downed tools in Petrograd on the 16th January, 1905. On the 21st *idem*, a group of strikers, led by the notorious Gapone, demanded that the Czar should receive a deputation at the White Palace, but Nicholas II. decided to remain at Tsarskoe-Selo. On the following day whilst a body of unarmed strikers were peacefully marching to the Winter Palace, they were fired upon by troops and charged by Cossacks; these operations claimed more than 4,000 victims and so exasperated the masses that it led them to commit great acts of violence and rioting continued for several days. On the 24th *idem*, a body of 20,000 strikers marched on Tsarskoe-Selo with a petition to the Czar; but the road was barred to them by infantry and artillery. The troops came into action, killing and wounding large numbers of the people. General Trepoff was now appointed Governor of Petrograd, with full powers to crush out the insurrection; he did this work with thoroughness, blood flowing freely in the streets of the Russian capital. The insurrection spread to Moscow, Warsaw and Sosnovice. The Grand Duke Serge, one of the pillars of the reactionary *régime*, was assassinated in the streets of Moscow on the 17th February, 1905, and, on the same day, 30,000 men again came out on strike in Petrograd. The situation became extremely serious in the following month; workpeople and the peasantry made common cause in setting fire to factories and country mansions. The trouble started in south and mid-Russia and soon spread to Livonia, the Baltic Provinces and the Caucasus.

IV. At last Nicholas II. appeared to be struck with fear; replying on the 19th June, 1905, to a deputation from the second Congress of the *zemstvos*, he promised to convoke a national Parliament. However, a deception was again practised upon the people. The Law of 19th August, 1905, which brought the "Duma" into existence, gave this body only consultative functions; its duty was merely to examine legislative proposals prepared for submission to the Council of the Empire and to report upon them; the Czar alone could give such proposals statutory effect. Moreover, the members of the Duma were at the complete mercy of the Government; the Senate could at all times deprive them of their seats. This shadow of a Constitution satisfied no one. Grave disorders occurred in Poland; a mutiny took place on the Black Sea on the warship *Kniaz-Potemkin*, the officers being killed by the crew; the arrival of this vessel at Odessa was later the occasion of a collision between the masses and troops; arson, pillage and murder were rife (6,000 victims). Sailors mutinied at Libau, but on the whole the Army and Navy remained loyal to their Ruler.

V. In October, 1905, the situation again became exceedingly critical; a general strike led to the stoppage of railway traffic and the mail service and completely paralyzed national life. The Government was obliged to make concessions; Witte ranged himself against Pobedonostzev and persuaded the Czar to promise Russia a Constitution, a ukase being published on the 30th October, in which it was announced that a National Assembly would be set up, liberty of conscience conceded and personal liberty guaranteed.

The bureaucracy realized that its power was menaced and astutely succeeded in inducing the Crown to enrol an anti-revolutionary Militia,

under the style and title of the "Union of the Russian People," later known as the *Black Hundred*. These mercenaries inaugurated a reign of terror, particularly in Odessa (1st to 4th November); the populace retaliated with a counter-move. It was hoped that the troops would side with the people, but disaffection had not penetrated very deeply into the Czar's Army at this date; three soldiers alone did so and their regiment conducted itself, apparently for this reason, with more than usual brutality against the insurgents. At Moscow alone there were 15,000 victims.

VI. During the autumn of 1905, the year of the "Abortive Revolution," many meetings of *zemstvos* were held with a view to the creation of political parties and the selection of candidates to represent them in the Duma. In addition to the Extreme Right and the Revolutionary (*i.e.*, Socialist and Labour) parties, there came into existence the Constitutional Democratic Party (known as *Cadets*, from the initial letters K.D., of the party name) and the Octobrists. The Cadets demanded the creation of a Constituent Assembly, whilst the Octobrists were willing to accept the extension of the suffrage, and a bi-cameral legislature, viz.:—the Duma and Council of the Empire; the latter became the Upper Chamber, half its members obtained their seats by election (Law of 20th February, 1906). The Czar attended in person to open the first meeting of this Duma (10th May, 1906). The Liberal parties had won 300 out of the 360 seats, and in reply to the address from the Throne put forward demands which brought them into collision with Goremykine, the Minister for the Interior, who peremptorily rejected their programme which included, *inter alia*, universal suffrage, a Parliamentary *régime* similar to that of Great Britain and France, expropriation of private lands, etc., etc. The Duma retorted by passing a vote declaring their want of confidence in the Minister for the Interior (26th May, 1905). But ministerial responsibility had not been provided for in the Constitution and, a few weeks later (1st July), the Assembly was dissolved; Stolypine now succeeded Goremykine. The Cadets, recalling the meeting of the Tiers État at Versailles in June, 1789, and the oath then sworn at the *Jeu de Paume*, to secure a Constitution for France, met at Viborg, Finland, and published a Manifesto (to which there were 181 signatories), in which, it was stated, that the Russian Constitution had been violated; they called upon the people to refuse to pay taxes and to decline to perform military service. The Government retaliated by meting out severe punishment to the signatories of the Manifesto and instituted travelling Courts Martial to deal with those who might be intending to promote a rebellion. Russia now passed under the heel of the secret police; the people were deprived of their most elementary rights, the Press was tightly held in a leash and all the concessions of 1905 were abrogated.

The first Duma, the so-called "Duma of the National Anger," had attracted to its membership the *élite* of Russian intellectual society; it lived for but 72 days. Within a year two of its members had been assassinated by the *Black Hundred*, three had been deported under ministerial decrees, eight had been removed from their districts, six had been banished into exile, one had disappeared.

VII. Stolypine now made preparations for new elections; he interpreted the Electoral Law to suit his own views and exercised shameless pressure. In spite of this the second Duma, which met on the 19th March, 1907, was no more favourably disposed to Autocracy than its predecessor. The Right and Octobrists composed one-fifth of the Assembly only. The Cadets remained masters of the situation, although their numbers had been reduced; to them then fell the choice of a President. Stolypine attempted to temporize and submitted a programme of reforms to the Assembly on the 1st April, 1907, providing, *inter alia*, for the emancipation of the peasantry and the assignment for their benefit of the Crown Lands. The majority, however, desired the adoption of effective measures and were not to be put off by promises. It demanded the suppression of the Court-Martial and the expropriation by the State of the large private estates. The Government now resorted to a mean trick; *agents provocateurs*, disguised as soldiers, pretended to hatch a plot and endeavoured deceptively to induce the deputies to countenance their action. They met with little success in their intrigues, nevertheless, Stolypine suddenly entered the Duma (24th June, 1907) and demanded that 16 of its members should be handed over into his custody and 55 others put under arrest. The Duma referred the matter to a Committee for investigation; this provided the necessary pretext for its dissolution, which took place two days later; a ukase was at the same time issued fixing the 16th September as the date for the new elections.

VIII. These elections did not take place in accordance with the rules promulgated in the Imperial decree of 1905; a good deal of jerrymandering took place, in which Kryjanovsky, the mischievous Secretary of State, played an active part. These elections resulted in giving the Right a majority in the third Duma; Khomiakov, an Octobrist, was elected President, and Prince Volkonsky, a member of the *Black Hundred* League, became Vice-President.

The Third Duma had a life of five years (November, 1907, to November, 1912); it devoted its attention to matters of minor importance which were in no way essential to the interests of the masses; *inter alia*, it created a class of peasant proprietors. This reform was initiated by Stolypine, who astutely desired to create a conservative element among the peasants that might act in opposition to the Socialistic tendencies of the *Mir*. Peasant proprietorship proved, however, a failure in Russia.

IX. Relieved for an instant from anxiety and all control, the hearts of the reactionaries leapt with joy. The Manifesto of October, 1905, the Right declared, had changed nothing; as the Autocracy was free to make concessions, so was it free to withdraw them. Much occurred during this period which was a source of considerable irritation to the Russian people. Fines and suspensions rained on the Press; Poland was crushed; Finland systematically molested, etc., etc. The only events favourable to Russia which occurred during the life of the Third Duma was the Entente between the great Slav Empire and Great Britain, formally sealed by the visit of Edward VII. to Reval (9th June, 1908).

X. The following notes deal with the political institution of Russia as they existed in 1912. The Constitutional changes resulting from the ukase

of October, 1915, were more apparent than real; Russia had been endowed with an elected Council and, it may be, that had this Council of the Nation not been in existence the Revolution of 1917 might not have grown beyond the dimensions of an *émeute*.

The creation of the Duma of the Empire did not kill autocracy and arbitrary rule. True, the Duma had the privilege of voting laws, but these remained a dead letter, until and so long as the Council of the Empire and the Czar decided to accept them. The deputies had not even liberty of speech in the Assembly. The Czar could at will prorogue or dissolve the Duma, and, in its absence, could continue to rule by promulgating ordinances, having the full force of law. Ministers were not responsible to the Duma; if interpellated they could refuse to reply thereto. The Duma only voted a part of the Budget; vast sums required for the public service escaped its control. Finally, the Government was in a position to suspend all the fundamental laws, merely by proclaiming a *state of siege*; this power was being continually exercised.

The body called the Senate in Russia is really an Appellate Court, a Supreme Court of Justice, and does not exercise the functions usually attributed to a Senate; it was created by Peter the Great. The real Upper Chamber (since 1906) is the Council of the Empire, originally created by Alexander I.; half its members are elected by various bodies and the remainder are the nominees of the Czar. The national crisis of 1916 brought the Council of the Empire into agreement with the Duma on essential matters; previously, it had as a rule been in opposition to it.

The Holy Synod, created in 1721, is charged with the Government of the Russian Orthodox Church. The reforms of 1864 abolished, in theory, the secret procedure in vogue up till then and separated the judicial from the administrative powers of this body, but in matters affecting marriage and divorce the ecclesiastical tribunals, under its jurisdiction, continued to sit in secret. The Russian Church has at no time risen to the height of its mission. Under its guidance a superficial Christianity of pompous ceremonies and ikons has prevailed throughout the land; it has been a church accommodating itself to licentious incredulity, sectionalism and the most degrading kinds of superstition. The Procurators, who represented the Czar, and, in consequence, presided at the Council of the Metropolitans and Bishops, have nearly all inclined to the side of the reactionaries.

XI. The vast edifice of the Empire rested on a hierarchic bureaucratic administration, organized on the lines of an army, having 14 grades called *tchines*. This administration has come in for more abuse than it has deserved; on the whole, it has been fairly efficient. It must be remembered that all bureaucracies tend to become arbitrary and corrupt when insufficiently controlled. The recruiting of this Russian bureaucracy was conducted on wrong lines, and hence desirable candidates avoided a career where vices have been held in higher esteem than virtues. The Russian Civil Administration was entirely of Germanic origin and was permeated with Germanic influences. An important part of it was the police, the political section of which, the *okhrana*, fully merits the severe condemnatory remarks passed

upon its methods, etc.; it was the former Third Section of the Imperial Chancellery of Nicholas I. (1826), which was reorganized by Alexander (1880). The methods of the police were summary and veiled in secrecy; spies and the *agent provocateur* were its principal tools. The *okhrana* was an *imperium in imperio*; in March, 1914, Vladimir Bourtzev enumerated 33 acts of terrorism charged against a single one of its agents, the notorious Azev. Many of the offences attributed to Nihilists were really the work of the police. The *régime* of the *okhrana* weighed heavily on the people, so much so indeed that in February, 1913, the *Golos Moskvy* (an Octobrist publication) expressed the opinion that: "The day on which Russia succeeds in shaking off the chains of the *okhrana* will be that of a second emancipation from serfdom."

XII. Oppressed Russia has been, however, permitted to enter upon its apprenticeship of political education and has experienced some alleviation of its miseries by reason of the activity shown by the *zemstvos* (Provincial Assemblies) since 1864, and by the *gorod* (City Corporations and Municipal Councils) since 1870, in connection with the practical problems of Local Government; politics were placed outside their sphere of influence by a law of 1864; but matters affecting the economic welfare of the people, hygiene, philanthropic endeavour and education were handed over to them.

In 1867, the Government attempted to paralyze the *zemstvos* in matters connected with schools and public libraries; and in 1874, their initiative in relation to public instruction was definitely killed. The more active members of the *zemstvos*, in consequence, formed a secret league, the *Zemski-Sabor*, with the object of securing reforms. In 1878, the *zemstvos* started a campaign of petitions, and appeared at one time to have won over Alexander II. to their views, but when the time for action arrived he refused his sanction to the measures proposed. In 1882, the control of education was taken entirely out of the hands of the *zemstvos*, and their functions were otherwise interfered with.

The famine of 1891 and the cholera epidemic of 1892 resulted in the restoration of some of their former powers to the *zemstvos*. During the Japanese War, a union of the *zemstvos* and the *gorod*, known as the *zemgor*, undertook many duties at the front and on the lines of communication, which were highly appreciated by General Kouropatkin; under Prince Lvoff, the future President of the Provisional Government of 1917, this body did much to make up for the defects in the supply services and in the hospital organization.

Lvoff has, during the present War, proved himself to possess high administrative capacity and has been the moving spirit in many departments connected with the prosecution of the War.

XIII. The gravest defect of an autocracy is that the power of its head is a sham; for in reality a large share of the power is in the hands of a number of irresponsibles, who exploit it for their own profit. As in other monarchies, so in Russia, the effective power has been in the hands of favourites or favoured ones; under Nicholas II. charlatans acquired a mysterious power which they pretended to use in furtherance of the interests of the dynasty.

The Czarina, who only gave birth to a male heir to the house of Romanoff in the tenth year after her marriage, appears to have been much concerned at one time at the prospect of a failure in the male line of the reigning dynasty in Russia and seems to have fallen under unfortunate influences in seeking the fulfilment of her yearning desire. She even went the length of approaching the President of the French Republic to secure the title of Doctor of Medicine for one Philippe, a Lyonnais hairdresser. This quack, having predicted that the Czarina was pregnant, when such was not the case, was disgraced, but his place was soon taken by others of his ilk.

The Cesarevitch has always been delicate and a story has been in circulation that an accident (or some mysterious circumstance) might lead to his being the last of his line. In the event of his death at an early age, the Czar's brother, the Archduke Michael, would succeed to the throne; the Czarina is said to have a great antipathy towards this brother-in-law. She seems to have been carried away by her maternal devotion and by her immense pride; her great ambition was that her son should succeed to unbroken autocratic power. Some affirm, whilst others deny, that she is German at heart. Her sentiments may become fully known when the materials for the full history of our time becomes available.

XIV. Two intriguing bishops, Hermogene and Theophane, introduced a monk named Iliodor into the Court; he has been responsible, since 1907, for the *Pogroms* (*i.e.*, the pillage and massacre of Jews). Iliodor acquired great power and passed for a saint; he in his turn took under his protection one Grigori Novykh, a Siberian peasant, who adopted the name Rasputin, *i.e.*, the Dissolute, as an act of self-reproach for the follies of his youth. Those who supported Rasputin most strongly were, it is alleged, persons at Court hostile to Iliodor and Hermogene. It was Madame Wyrouboff, maid of honour to the Czarina, who seems to have made Rasputin's fortune. Rasputin was a first-class rogue and claimed that he had been invested by Divine Providence with the power to perform even miracles. Rasputin's influence at Court became exceedingly great; he persuaded the Holy Synod to dismiss Hermogene; Iliodor was chased out of the Church and imprisoned, owing to the Siberian, but later managed to escape to the United States of America, where he remains. Rasputin's power at Court gave rise to scandals, so much so indeed that in 1912 the newspapers were forbidden to mention his name. The *Golos Moskvy* disobeyed this injunction, and suffered the confiscation of its offending sheets. An echo of these scandals was heard in the Duma; "The sanctity of the altar and that of the throne are," cried out the Deputy Goutchoff, "in danger; there exists at the heart of the people a festering ulcer." Rasputin was obliged to withdraw himself from the Royal palace, but in doing so, hurled menaces and announced that his presence was essential to the well-being of the Imperial Family. The Cesarevitch now fell ill; the Duma having meanwhile been prorogued, Rasputin was recalled, and the heir to the throne quickly recovered. In April, 1914, this adventurer was violently attacked by Bishop André of Ufa, but the fashionable world continued to pay him court and strange stories were afloat concerning

his *amours*. The Holy Synod of Russia did not treat Rasputin with the same firmness that the Roman Church has exhibited under similar circumstances; the latter Church has broken many men of his stamp, but the former, knowing all, was purposely blind.

Rumour may have credited Rasputin with more misdeeds than he was really guilty of; one thing is certain that with all his coarseness, he exercised a strange and dangerous fascination over the weaker sex, in the highest as well as in the lowest social class.

XV. The Extreme Right expected to secure a majority in the Fourth Duma; the pressure exerted by Makharoff, the Minister of the Interior, passed all bounds, and should have resulted in an enormous majority for this party. The turn of events, however, brought about an unexpected situation; many reactionary deputies, elected owing to Government support, transferred their allegiance to the opposition. It was in the ranks of the Cadets that the energetic, forceful and upright politicians were once more to be found; the chief amongst them was Miliouköff, formerly a professor at the Universities of Moscow and of Chicago. Among the new members was Kerensky, Deputy for Saratov, then aged 30. An ardent believer in the cause of liberty and justice he had been impelled by unseen forces into the ranks of the Extreme Left. By Kerensky's side stood another man with a future, Tchkheidze, a Caucasian deputy, who was the sole survivor amongst the social democrats of the Third Duma.

XVI. The Fourth Duma, from the time its first session came to an end (28th December, 1912), began to appeal to the Government to give effect to the spirit of the Imperial ukase of October, 1905, in the matter of Constitutional reforms. The municipal elections in Petrograd, which had taken place at this time, ended in a defeat for the Right and put the opposition in the majority.

On the 6th March, 1913, the Duma gave a favourable reception to a new Manifesto from the Czar, issued to commemorate the tercentenary of the birth of the Romanoff dynasty, in spite of the fact that no promises similar to those of 1905 were contained therein. A few weeks later, however, a resolution was passed, by 146 votes to 113, calling attention to the oppressive measures still being taken by the Government, although order had been completely restored. The Ministers of Justice and Public Instruction gave on this occasion a catalogue of the illegal acts, etc., alleged to have been committed by the Imperial Government. In consequence of the incessant provocations fresh strikes broke out and nearly a million workmen downed tools, 100,000 of them in Petrograd alone (19th November, 1913). Representatives of the Municipalities had gathered at Kieff (in October), to pass resolutions of a character extremely hostile to the Government, but the police intervened and broke up the meeting. The Octobrists were now becoming more and more independent and openly ranged themselves against the Council of the Empire and decided to fight the Government with every legal weapon within their grasp.

The Russification of Finland continued with unabated vigour and raised reiterated protests on the part of the Liberals.

XVII. In 1910, Sazonoff, a liberal-minded and honest statesman,

took over the Ministry of Foreign Affairs and succeeded, in spite of Slavophil agitations, in maintaining, during the Second Balkan War, the principle of joint action on the part of the Great Powers. In order to secure peace he agreed to the cession of Scutari to the Albanians, as demanded by Austria, and soundly rated the King of Montenegro for his obstinacy, which had nearly set Europe in flames. Kokovtseff, the Russian Premier, also showed a pacific attitude and was equally anxious to see the Balkan difficulties removed, owing to the concert of the Powers, by agreement between Austria-Hungary and Russia. Liberal Russia was as pacific as its Government; but the internal situation of the country was becoming acute. The Czar had, in connection with the jubilee of the creation of the *zemstvos* (January, 1914), been pleased to recognize their services to the Empire, but said no word that could be construed as indicating that the powers of the bureaucracy and the police would be in any way curbed. The menacing words then, particularly addressed to the Octobrists, which were spoken by Milioukoff at the banquet given in Petrograd to wind up the jubilee fêtes fell as a bombshell.

XVIII. The Government continued its policy of pin-pricks. It refused to allow the centenary of Taras Shevtchenko, the national poet of the Ukraine, to be celebrated and thus caused a protest to be raised in the Duma. It condemned Professor Baudouin of Courtenay to be imprisoned for two years for having published, in 1912, a pamphlet in favour of Federal Government. He was, however, provisionally set at liberty. His release caused enthusiastic demonstrations of sympathy and he became the recipient of congratulations from practically all parts of Russia. In March, 1914, further serious strikes broke out in Petrograd and the Government again resorted to measures of extreme severity in repressing them. They even went the length of prosecuting the Deputy Tchkheidze for a speech made by him in the Duma. A few weeks later the Duma was warned that the Government intended to carry out a *coup d'état* against it with the aid of its favourite auxiliaries, the *Black Hundred*. Many questions affecting the public interest came before the Duma at this time; Rasputin was once more denounced in the Assembly; the Beilis case gave rise to violent scenes and led to the resignation of the Vice-President of the Duma; Kasso, the Minister of Public Instruction, who had been allowed to remain in office, in spite of his scandalous conduct, was violently attacked; Soukhomlinoff, the venial Minister of War, was equally badly handled. An attempt was made to meet the situation by proroguing the Duma (27th June), and its sittings were not resumed till 28th October. In the meantime strikes began to multiply in an alarming manner. At Moscow and in the Caucasus the repeated strikes gave birth to the idea that an attempt should be made to effect a mobilization of the proletariat for the purpose of fighting the Government.

XIX. With Germany's sudden declaration of War (1st August, 1914) the danger of Civil War at once vanished. Poles, Finns, Little Russians, Caucasians became united in a common cause, the defence of their homes. Abroad, Russian exiles, at enmity with one another, became reconciled; thus the anarchist Kropotkine held out the hand of friendship to his old

opponent Plekhanoff, the leader of the Social Democrats. All the strikers, with one accord, picked up tools and restarted work.

XX. All honour, be it said, is due to the Czar in spite of his faults, for having taken the initiative in calling together the first Hague Conference. He it was also that, with a stroke of the pen, suppressed the drink traffic in Russia. The abolition of the vodka monopoly was the supreme benefit conferred on the Slav Empire by the old *régime*.

XXI. Anatole Leroy-Beaulieu, who knows Russia intimately, has many a time sounded the warning note that Russia was ill-prepared for waging an offensive war and, moreover, that the sympathies of the ruling class were decidedly pro-German. The pro-German sympathies arose not only by reason of the alliance of the House of Romanoff with the House of Hesse by marriage, but also by reason of the profound repugnance of Russian officialdom to the democratic institutions of the Entente Powers. The *Zemstchina*, a favourite journal of the reactionaries, and one which was strongly supported by the War Minister, continued to advocate a *rapprochement* with Germany and held up to opprobrium Great Britain and France, countries alleged "to be governed by Freemasons and Jews." The fashionable salons of Petrograd were the hotbed of Germanic influence and propaganda; the Slavophil movement, of which Moscow was the centre, and the democratic movement, which was up against Prussianism, were able to make but little headway in opposition to Germanic interests in the highest social and bureaucratic circles.

The Tannenberg disaster (August, 1914) and the retreats from Galicia and Poland (May—September, 1915) were wanted in order to bring home to the Russian people the fact that not only were they being ill served and robbed, but also betrayed. The affair of Lodz, where Rennenkämpf showed almost criminal negligence, undoubtedly moved public opinion in Russia profoundly.

When the Russian Armies had to retreat from the Dunajec, owing to a failure to supply it with arms and ammunition, when Poland and the fortresses of the Niemen fell into enemy hands, it was not the Grand Duke Nicholas who was blamed; indeed, it was recognized that he also had been betrayed, as was the case with Russia herself. But it was Soukhomlinoff, who had not ceased to declare that Russia was amply provided with military equipment, etc., who had to give place to Polivanoff; at the same time, Colonel Miassoyedoff was arrested and executed.

XXII. Sonkhomlinoff and Miassoyedoff had married bosom friends. The former's wife had extremely close relations with one Altschiller, an Austrian contractor, having business relations in Germany. Soukhomlinoff had been denounced in the Duma in 1913, in relation to certain scandalous transactions. Later, it transpired that he had personally acquired considerable riches. There seems little doubt that his Ministry had become a nest of spies, against whom no effectual action could be taken owing to the protection afforded them by him. Miassoyedoff was formerly a member of the *okhrana*. He had long been stationed, in a confidential post, at Wirballen, on the Prussian frontier; he had, during his stay there, established intimate relations with the

Prussian nobility in the neighbourhood. When the War broke out he was attached to the Grand Duke Nicholas's Staff. The Russians learnt that all their plans were being communicated to the Germans by him; this was ascertained from a letter found on a German officer taken prisoner by the French. Missoyedoff had been suspected of treachery since 1912.

Although Russia had great factories, which could have been organized for the production of munitions, no steps were taken to this end until Polivanoff succeeded to power. The *zemstvos* intervened actively in this matter, acting independently of the bureaucracy. The work at the Russian factories was speeded up by degrees and eventually their output was increased tenfold. Russia had been receiving immense quantities of munitions from Great Britain, the United States of America and Japan but the leakage was so great as to swallow up a very great part of these consignments.

XXIII. The national anger was growing, but the Government's only reply was a further resort to the policy of *pogroms*; *i.e.*, an attempt was made to divert attention from the delinquencies of the bureaucracy by letting assassins loose on to the millions of unfortunate Jews who inhabit Russia and Poland. Rivers of blood were made to flow in the Jewish quarters of the towns. On the 5th July, 1915, the whole of the Jewish Press was suppressed. The persecutions of 1881 and 1905 shade into insignificance by the side of the massacres which now took place.

These infamous acts did not succeed in diverting public opinion. An influential committee was now formed, under the Chairmanship of Count Ivan Tolstoi, Mayor of Petrograd, and a petition was promoted by it claiming civil and political equality for the Jews. Protests were also raised in the Duma against the excesses committed against the Jews. "The offenders are not," said Tchkheidze, "the Jews; they are those who have enriched themselves at the expense of the Army, they are those who have sold Russia, led by the Miassoyedoffs. And if it is really desired to find the offenders, it becomes necessary to throw a searchlight on the *rôle* played by Maklakoff, the Minister of the Interior."

XXIV. The new session of the Duma was opened on the 1st August, 1915; Goremykine made a conciliatory speech. The Imperial promises made in respect of Poland were re-affirmed. The Government recognized that the Administration was being overwhelmed by the exigencies due to the War and put forward a proposal for the formation of a Munitions Department to be run by representatives from the *zemstvos*. A Committee was accordingly formed under the presidency of Goutchkoff, who became Minister of War later (March, 1917).

On the 3rd August, after the re-election of Rodzianko as President, the Duma passed a resolution declaring the determination of the nation to see the War through to a finish. The opposition demanded that disciplinary action should be taken against those responsible for the deficiencies in munitions that had come to light; a Commission was appointed to investigate the matter. The meeting of the 14th August was particularly stormy, many of the grievances of the nation being passed in review. But the Government staved off defeat.

At the end of August some members of the Duma and of the Council of the Empire met with a view to the selection of a man of energy and vigour to succeed the somnolent Goremykine as Premier. A demand was made by the Municipal Congress of Moscow for the replacement of the obscure bureaucrats in charge of the nation's affairs by men well known to the people. Once more the nation raised its voice against the apathy and incapacity of those in charge of the Administration.

XXV. At the beginning of September, 1915, it appeared for an instant that the Czar and his subjects were at last of one mind. After taking over Chief Command of the Russian Armies in the field, Nicholas II. pronounced words which carried comfort to the nation. All the institutions in Russia had responded splendidly to the call of patriotism; the Czar reiterated the nation's desire to fight to a finish, and Rodzianko replied that Russia had ranged up round her sovereign and was prepared to make every sacrifice in order to release herself for ever from the chains which Germany had forged wherewith to bind her. However, the Russian disaffection proved too deep rooted to be removed by the flow merely of fair words. A new rupture now took place owing to the attitude of the Left in the Duma, which expressed a wish to see ministerial responsibility to this Assembly established. Nicholas II., being irritated or circumvented, prorogued the Duma, on the 16th September, to the 14th November. More strikes and *émeutes* now took place and the newly-appointed Minister of the Interior, Stcherbatoff, had to retire in favour of Khvostoff, a former Governor of Kieff; the latter's first act was to proclaim martial law in Moscow. The elections to the Council of the Empire which now took place resulted in important gains to the progressives. In November, there was further trouble in the Duma. In addition, the Germanophil tendencies of the Extreme Right began now openly to display themselves.

XXVI. Peace rumours were being insistently circulated in Russia in January, 1916, although, at the review of the Knights of St. George held on the second of that month, the Czar had expressly stated that he would be no party to a peace until the last German soldier had been chased from Russian soil. It was even said that Germany had specifically put peace proposals before Russia and Japan. In reply to questions on the subject, the Russian Foreign Minister gave the ambiguous answer that a great number of peace offers had been received, but no notice had been taken of them. There existed a strong suspicion that there were persons in Russian high circles who were disposed to betray the Entente, and, indeed, it was openly so stated in the Duma in July, 1916.

On the 3rd February, 1916, Stürmer, a *protégé* of Rasputin, succeeded Goremykine, as President of the Council of Ministers. The Duma reassembled on the 16th *idem*, the Czar attending the ceremony. Stürmer and Polivanoff made patriotic speeches; the former promised municipal reforms, the latter spoke in laudation of the reorganization of the Army. Sazonoff also spoke, declaring with vehemence that the Entente must put an end to the voracious appetite of Pan-Germanism; that the whole of Russia wished to see an autonomous and reconstituted Poland. During this debate, Tchkheidze too made a speech; this was

at first kept out of the papers by the censor. He accused all the Great Belligerent Powers of egotism and stated, on behalf of himself and his Socialist friends, that they wished for a peace without annexations and indemnities, and that this was also the wish of the German and Austrian Socialists.

XXVII. The position of the Liberals now became very strong in the Duma; the moderate Nationals, the Centre, the Octobrists, the Progressionists and the Cadets formed a "progressive *bloc*." This *bloc* was determined to carry out the policy of prosecuting the War to a finish; the Extreme Right and the Extreme Left alone opposed this policy.

At the beginning of March, 1916, the Cadets held a meeting and published a Manifesto declaring that Europe and Russia were not perpared to tolerate Prussian Militarism; that Belgium and Serbia must not disappear; that Poland and Lithuania could not remain in the grip of Germany; that Armenia must not be handed over to German executioners. The task of winning victory, it was said, was inseparable from that of affecting internal reforms; in order to conquer it was necessary to reorganize the nation.

The disclosure of a scandal connected with the use of the funds of the Ministry of the Interior led to the retirement of Khvostoff who was succeeded by Stürmer (19th March).

Protopopoff, having visited Paris in May, returned to Russia *viâ* Stockholm; and it is alleged that during his stay in the latter city he paid several visits to a Hamburg banker with whom he had been put in touch by the German Ambassador in Sweden. Offers of a separate peace are said to have been discussed at these visits, and it is further suggested that funds were placed at Protopopoff's disposal for starting a newspaper.

On the 23rd May, changes of considerable importance in the Government were suddenly announced and caused a good deal of astonishment. Sazonoff was succeeded as Foreign Minister by Stürmer; Khvostoff went back to the Ministry of the Interior; Makharoff took over the Ministry of Justice.

Public opinion, being ill informed concerning the secret forces in play and of the "Rasputin policy," attributed the downfall of Sazonoff to the Polish situation, which, at that time, was occupying the Entente Diplomacy. The fact is that Stürmer, with the support of the Czarina, had caused imputations to be cast on Sazonoff's loyalty in relation to proposed reforms in Poland. Stürmer did not commit himself with regard to Poland; he temporized, hoping thus to give satisfaction to the Extreme Right and to the Court Party.

Towards the end of July, 1916, the Russians completed, by the capture of Erzindjan, the conquest of Armenia and, at the same time, Broussiloff's offensive in Bukovina and in Galicia was eminently successful. However, just when expectation with regard to the capture of Lemberg had reached its culminating point, the spirit of the Russian troops appeared suddenly to droop; it began to be rumoured that the ammunition supply had failed and this probably was true. The manufacture of ammunition in Russia and its importation into the country had been continued unceasingly, but for some mysterious reason it was not reaching the Russian Armies in the field.

XXVIII. Under all the circumstances, the advice given by Broussiloff to Roumania not to enter into the War was decidedly sound; but he was almost the only person who took this course. The Russian Government and Press insisted upon Roumania's participation in the War as a belligerent. The Roumanians were told that if they struck at Transylvania and Hungary, Russia would co-operate by an offensive move on Dobrudsha. Roumania declared War on Austria on the 27th August, 1916, and at once invaded Transylvania, leaving but few troops on the Dobrudsha. The assistance Russia provided proved insufficient and, in consequence, the Dobrudsha was overrun by Germano-Bulgarian forces. The Germans were also successful at Craiova and seriously threatened Bukharest. It was believed that a large Russian Army was marching at this time from Bessarabia and Moldavia on to the Argesu, and the German Armies appeared to be in a perilous position; the strategy of the German Great General Staff had been considered recklessly bold by the ill-informed. No Russian Army put in an appearance to relieve the pressure on Bukharest. Roumania called in vain for guns and munitions; the guns and munitions sent by Great Britain and France for the Roumanian Army were held up on the Russian railways. Bukharest fell on the 6th December, 1916, and the troops of Central European Alliance occupied Wallachia and the Dobrudsha. The Russian Army in Moldavia now covered the retreat of the main Roumanian Army and gained time for it to be reformed behind the line of the Danube.

Public opinion was as much disturbed in Russia by these untoward events as was public opinion in the countries of her Allies. In consequence, when Protopopoff succeeded Khvostoff, as Minister of the Interior, voice was given to the resentment against him. The situation became so critical that the Imperial family had to intervene. The widow of Alexander III. had rarely seen her son in recent times. She had completely fallen out with her daughter-in-law over Rasputin and his *clique*. In October, 1916, she however met Nicholas II. and had a long interview with him. In well-informed circles, it is stated, that Sir G. Buchanan, the British Ambassador at Petrograd, had urged the Czar to appoint a responsible Cabinet and to get rid of Rasputin. The Czar refused to do so. The Czarina was not by any means discouraged; she felt that she had the support of the Grand Dukes. Nicholas Michaelovitch presented the Czar with a document, prepared by members of his family, urgently pressing upon him the necessity of adopting measures similar to those advocated by Sir. G. Buchanan (15th November); Nicholas II. was also entreated to replace Stürmer by Trepoff and to remove from the Court persons of German sympathies, particularly Protopopoff. The Czar appeared to be disposed to listen to reason, but the Czarina, learning of what was in the air, hastened to his side; and having heard Rasputin's name referred to in the document, she seized it and burnt it.

The Duma reassembled on the 14th November, 1916. The President again announced that Russia would never betray her Allies and repudiated with indignation the very idea of a separate peace. The Government again accepted the principle of a Poland

reconstituted in its entirety. The pro-German tendencies of the Ministers were denounced by Milioukoff, and others, and gave rise to disorderly scenes. Stürmer decided to arrest Milioukoff, but had to desist in taking this step owing to imposing demonstrations made in his favour in the Duma.

The position of Stürmer became exceedingly difficult, particularly in view of the strong complaints made against him by the British Ambassador at Petrograd; on the 24th November he was appointed Court Chamberlain and Trepoff took his place.

XXIX. Trepoff would have liked to dismiss Protopopoff who, with Stürmer, was mixed up in the Pacifist intrigues in progress at Stockholm since the beginning of 1916, under the auspices of a body styled the "Party of the Greens." It is said that Trepoff offered Rasputin 150,000 roubles (about £15,860) if he would get rid of Protopopoff, but contrary to his usual practice, the Siberian rascal refused the gift.

It is believed that Rasputin had been bought by Germany and Bulgaria in 1915. It was in 1916 that this blasphemer made the following remark: "I am only a simple peasant, but one to whom the Almighty has spoken. The Czar is well aware that the life of his only son depends on my prayers. Great persons have endeavoured to have me removed; I spew on them. The spirit of God is in me. The Czarina accedes to my smallest wish. *I have told the Czar that the War is a crime and that it will be the cause of his downfall.* It is necessary above all things that I should work to bring it to an end."

XXX. On the assembly of the Duma on the 2nd of December, Trepoff made a patriotic speech referring therein to the reconstitution of Poland and the conquest of the Bosphorus Channel as being indispensable to the future of Russia. He further declared that it was the desire of the Government to co-operate with the Municipalities and *zemstvos*. His remarks were interrupted by loud cries of: "We do not believe it." The continued presence of Protopopoff on the Government benches readily explains the cause of the dissatisfaction shown by the Duma. Pourishkevitch, from his place in the Duma, implored the Czar to be no longer blinded, but to see to it that Russia was no longer controlled by men in the pay of Germany.

In the Council of the Empire, Trepoff exhorted all parties to work together in the common cause and to put away their differences. The Council passed a resolution calling on the Government to co-operate with the Liberal institutions of the land and to suppress occult and irresponsible influences (9th December). This resolution of the Great Russian Conservative body was much commented upon, nevertheless Protopopoff and Rasputin, who were directly aimed at, remained where they were, one the strong pillar to the other, all powerful at Court.

On the 12th December, 1916, the Imperial Chancellor at Berlin issued his now famous German peace note; Russia, acting in concert with her Allies, rejected the proposal as being a trap. Pokrovsky, who was appointed Foreign Minister on the 14th *idem*, lost no time in associating himself with the Entente reply, refusing to be drawn into useless negotiations. On the 27th *idem*, the Czar published a Manifesto in which he reiterated the decision of the Entente Powers not to enter into any dis-

cussion of peace terms; that the invader must be first chased from Russian soil, a free Poland must be constituted, Constantinople must be captured; the task before them was immense and required the co-operation of all the country's forces.

The foregoing declarations were calculated to inspire confidence, as both the Czar and Pokrovsky were credited with being sincere; however, the hidden forces menacing Russia had not yet been got rid of and continued to threaten both the honour and the liberties of the country.

XXXI. In the midst of the disquietude that prevailed at this time there occurred a tragic event that absorbed all attention. Rasputin was shot dead at the house of Prince Youssoupoff (December 30th), his body being thrown into the Neva, where it was found by divers on the 1st January. It is stated that the Czarina claimed the bloodstained shirt of the murdered rogue, in which to wrap her own son, and that the body was interred in the Imperial necropolis at Tsarskoe-Selo; the corpse was exhumed during the first days of the Revolution and burnt. Two inquiries were immediately held in connection with Rasputin's death; an official one by the Minister of Justice; the other, a secret one by Protopopoff and his coterie. Trepoff and Ignatieff learnt from the newspapers that they had been dismissed from their posts. Trepoff's place was taken by Prince Galitzine. Petrograd realized that the true master of the Government was from now Protopopoff; he had learnt, it was said, all Rasputin's dodges. Soon, another *moujik*, Mitia Koliagu, more ignorant than even Rasputin, was brought to Court to take the latter's place and to be the new oracle.

Orders were given to the Governors of Provinces to be very severe, in view of the unrest amongst the masses and the possibility of uprisings. The Council of the Empire, having exhibited liberal tendencies, its numbers were increased by an ukase; the 18 new members appointed to this body nearly all belonged to the Extreme Right. Pokrovsky, having proved troublesome, was sent away on two months' leave. The Duma and the Council of the Empire were adjourned, first to the 25th January and later to the 27th February. It was thus that Protopopoff ushered in his Dictatorship. Meanwhile Count Benckendorf, the Russian Ambassador at the Court of St. James', died in London (20th January) with the words on his lips: "An epidemic of a mysterious kind of mental alienation is afflicting the ruling powers in Petrograd." A number of undesirables now climbed back into power, more worthy men having resigned their appointments or having been sent on leave.

The notorious Stcheglovitoff, the guardian angel of the *Black Hundred*, became President of the Council of the Empire; Stürmer again took his seat in the Foreign Office.

Nicholas II. was living at this time at the Russian G.H.Q. at Mohileff, surrounded by military officers, and to some extent outside the evil influences which reigned supreme at Tsarskoe-Selo and Petrograd; there is nothing to connect him with the designs of the promoters of the "German peace." On the 20th January, he addressed a rescript to Prince Galitzine, in which he laid down a truly national programme, and, on the 25th *idem*, His Majesty appointed a Commission to draw up the Constitution of the Poland of the future.

It is said that during his visit to Russia, Lord Milner endeavoured, with some persistence, to bring home to the Czar the pro-German intrigues which had spun, as it were, a spider's web round him; but Nicholas II continued to pursue his blind and fatuous course.

The Duma and the Council of the Empire resumed their sittings on the 27th February, 1917. Meanwhile, at a meeting of Russian nobles held at Moscow, a resolution was unanimously passed calling on the Czar to give effect to the resolutions repeatedly passed by the Duma and the Council of the Empire, demanding the introduction of reforms and the appointment of Ministers possessing the confidence of the people.

In high quarters, and in low, the same views were being urged with insistence and incessantly, but in the highest quarter there was systematic neglect to give heed to the warnings to set the Russian house in order.

XXXII. The month of March, 1917, which was to witness the birth of the new liberties of Russia, came in at a time when dark clouds had made their appearance on the horizon. Although Russia had not exported anything for three years and had in reserve large quantities of wheat, yet her people, in the great centres of population, were on the verge of starvation. This condition of affairs was due either to the incapacity or the dishonesty of the Administration, which had failed to make the best use of the transport facilities in the country; maybe it desired—so it has been supposed—to increase scarcity of food stuffs so as to exasperate the people, in order to justify repressive measures, or even to find a new argument in favour of a capitulation. Moreover, it had been noticed that the German Chancellor, when he had last addressed the Reichstag, had carefully refrained from making any allusion to Russia and to the German schemes of annexation in the East. Abroad, in spite of the strictness of the censorship voice was given to the disquietude which existed in relation to Russian affairs. Towards the end of January, 1917, the Petrograd police became very active, raising machine-guns to the top of the tallest buildings in the Russian capital; the excuse given was that these guns were intended for anti-aircraft defence. The prosecution of Manouiloff, secretary to and an accomplice of Stürmer, for having extorted 25,000 roubles (about £2,640) from the Bank of Moscow, was begun at Petrograd on the 1st March, and five days later he was convicted and awarded 18 months' imprisonment. The result of this trial should have proved a serious warning to the reactionary party, which had exploited Manouiloff.

On the 8th *idem*, the Council of the Empire refused to allow the prosecution instituted by Stürmer against Milioukoff to be carried to the Courts, his alleged offence being covered by privileges of parliament, although such privileges were not expressly defined by statute.

About this time rumour was busy concerning the probable early dissolution of the Duma and a *coup de force* against those in opposition to the Government. Western Europe was without news from Russia and it was felt that dark doings were in progress.

XXXIII. On the 7th March, the first "hunger strikes" occurred in Petrograd; the bakers' shops were pillaged. The military commandant made it known that the troops would fire on people taking part in

demonstrations. The situation became gradually worse, a general strike of factory and transport hands was ordered; the printers also downed tools and newspapers could not, in consequence, be published. An immense crowd, still pacific, watched the strikers marching round the city. Violent speeches were delivered before the Cathedral of Kazan, within earshot of the police. Some believe that disguised policemen were amongst the most excited of the orators who harangued the strikers. When the crowd reached the Perspective Nevsky, the Cossacks were ordered to disperse the people; but they merely rode in amongst the people and smilingly raised their whips without using them. The crowd cheered. Soldiers marched out of the barracks to support the Cossacks; but they belonged no longer to the Prætorian army of 1905. These soldiers began to fraternize with the strikers and to crack jokes with them.

The Duma urged, with unanimity, that the revictualling of the large towns should be confided to the Union of Municipalities and of the *zemstvos*, as also the distribution of supplies. The Administration held this to be a vote of censure and a threat. On the same day the Czar signed two ukases at the Russian G.H.Q. suspending respectively the meetings of the Duma and the Council of the Empire from the 11th March to the end of April. Protopopoff made ready to bring the rioters to reason; he had 4,000 police and about 1,000 machine-guns at his disposal.

The 11th March was the decisive day. Long columns of rioters directed their march on the Winter Palace, with the intention of setting fire to it. The police fired on the crowd, but the troops summoned in haste to their aid refused to use their weapons. The police became exasperated and brought their machine-guns into play; street fighting began, which lasted for two days.

The Duma was about to disperse in obedience to the Czar's ukase, as a large number of deputies were wholly averse to a revolution at a time when Russia had a large War on hand. However, a body of 3,000 soldiers, drawn from the Guards regiments in Petrograd, suddenly appeared on the scene and sought instructions from the Duma; Rodzianko at once recognized that, in order to avoid being submerged and to prevent anarchy being given full reign, the Duma must itself take control of the movement. The soldiers were told that the first thing to be done was to get rid of the old *régime*, but that they were not to come into collision with the people. The Duma formed an Executive Committee, with which was soon associated a kind of Committee of Safety, elected in haste by workmen and soldiers. Prince Galitzine resigned, on the date last mentioned.

Rodzianko telegraphed to the Czar, in the name of the Duma, informing him that the situation was exceedingly serious and that immediate action had to be taken; he informed the military and naval chiefs at the same time that a Provisional Government had been formed. During this time, workmen assisted by soldiers had taken possession of the Arsenal, the prisons and the fortress of St. Peter and St. Paul; the occupants of the latter institutions being set at liberty. The Law Courts and prison adjacent thereto were set on fire; the section containing

the records of the police were in flames for three days—the loss of these records is an irreparable loss to future historians. The police were hunted down and killed; Army officers who did not wish to be associated with the Revolution were disarmed or shot down by their men. On the 13th March, street fighting continued, the buildings in which the police had entrenched themselves were taken by assault and the defenders massacred. The insurgents next took possession of the Admiralty offices and made the Minister of Marine, who had been abandoned by every one, prisoner. Many of the troops in Petrograd rallied to the revolutionary cause and were received on the steps of the Duma by Rodzianko, who harangued them. Former Ministers, including Galitzine, Stürmer, Stcheglovitoff, Bark and many others were incarcerated; Protopopoff, more dead than alive, voluntarily surrendered himself to Rodzianko. Soukhomlinoff, who had been under arrest since March, 1916, was brought before the Duma; the soldiers wanted to kill him, but the Duma spared his life; he was, however, degraded by having the epaulettes torn off his uniform. The French and British Ambassadors made their way to the Foreign Office and were received with acclamations by the crowds.

On the 14th March, the Revolution spread to Moscow, Kharkov, Odessa and other towns. Troops arriving from the vicinity of the capital received a regular ovation. In Petrograd, a small red flag, the symbol of liberty won, was displayed everywhere. The Duma sent two deputies to Kronstadt, where, after some hesitation, the troops were won over to the Revolution.

The newspapers reappeared in Petrograd on the 18th March, and the city began to resume its normal condition; the situation was slowly improving. From this date the Executive Committee of the Duma took charge of affairs, it was later succeeded by the Provisional Government and by a Committee, known as the *Tauride*, from the palace of that name where it held its sittings under the Presidency of Tchkheidze.

The *Tauride* was composed of delegates elected by workmen (in the proportion of one per 100 voters) and by the troops that had revolted (in the proportion of one per company); it was very unwieldy and noisy. It would listen to no proposals for a compromise, it insisted on a complete break with the old *régime*. An understanding was at last arrived at between the two Committees on the 15th *idem* and a Ministry of National Defence was formed.

The Duma had not foreseen a rupture with the ruling dynasty; it is just a question whether the majority really desired to go to such extremes; having been elected under the system inaugurated on the 16th June, 1907 (*i.e.*, under Government and police control), it only very imperfectly represented the opinions of the non-official, urban and the rural classes of Russia. It is this fact that at first seemed to legitimize the active and permanent control by the *Tauride*. But it was recognized that the workmen and soldiers in Petrograd had no claim of right to speak for the whole of Russia, and, in consequence, the *Tauride* forthwith made an appeal to the representatives of every class of workmen and of the Army throughout the Empire. A National Congress, consisting of these representatives, concluded their sitting

on the 24th April, 1917, by passing a Vote of Confidence in the Provisional Government and conferred on the *Tauride* the right to control the present and future acts of this Government, until such time as a Constitutional Government might be formed.

XXXIV. Nicholas II. was at the Russian G.H.Q. at Mohileff when he learnt, on the 12th March, that events at Petrograd had taken a serious turn. He decided to return to Tsarskoe-Selo, half-an-hour's railway journey from Petrograd, in order to confer with Rodzianko. The Imperial train started at daybreak on the 13th *idem*, but was stopped *en route*; the news came through that the insurgents were in possession of the railway track and that the Petrograd garrison had joined the Revolutionists. "If the people wish it," said Nicholas, "I will abdicate and I will go and live in Livadia," and added with tears in his eyes: "Provided my wife and children are safe!" It was decided to turn back, in order to reach Pskov, the capital of a small Republic destroyed in ages past by the Czars of Moscow; the train arrived there at 8 p.m. on the 14th *idem*.

General Roussky waited on Nicholas II. at the railway station. The Czar declared his readiness to appoint a responsible Ministry. "Too late," was the General's reply. At daybreak on the following day, Roussky was in telephonic communication with Rodzianko for two hours; in view of the turn of events he advised the Czar to abdicate, who, in consequence, decided to adopt this course and a telegram to Rodzianko, announcing his intention, was prepared and signed by Nicholas. This telegram was not despatched as Choulguine, a delegate from the Executive Committee of the Duma, and Goutchoff, a member of the Provisional Government, announced that they were on the way to Pskov; they arrived there at 10 p.m. on the 15th March.

The Czar did not know Choulguine, and he had no liking for Goutchoff, who had been responsible for ventilating the Rasputin affair in the Duma. However, he received both the delegates most courteously in his railway coach, in the presence of Freedericks and General Nariskhine, two Court officials. General Roussky joined them. Goutchoff was the first to speak and advised the Czar to abdicate in favour of Alexis, and to appoint the Grand Duke Michael Regent. Nicholas explained that he felt he could not separate himself from his son, but agreed to abdicate in favour of his brother Michael. The delegates accepted this proposal, at the same time stating that this was not the solution of the difficulty that had been expected. The Czar returned to a neighbouring railway coach and at 11.15 p.m. (15th March) the act of abdication was ready; at Choulguine's request words were added in the document prepared by Nicholas II. to make it clear that Michael was to be a *Constitutional Monarch*. Copies were made of the act of abdication; the Czar signed one copy in pencil, and also nominated Prince Lvoff President of the Council, and the Grand Duke Nicholas Generalissimo in order to provide for continuity of administration. The Imperial train then started off for Mohileff.

The act of abdication signed by Nicholas II. struck the delegates, as it has the whole world, by its style and by the nobility of the sentiments expressed therein. The ex-Czar has neither literary talent nor

does he fall in the category of "Great Men"; yet the last State document penned by him is comparable to the admirable testament of Louis XVI., and provides evidence that the language of a mediocrity even can reach a high standard in the tragic circumstances under which such a one expiates the error of his ways and miscalculations.

XXXV. Petrograd bore the aspect of a camp on the 15th March. The whole population was in the streets, fraternizing with the soldiers; deputies were haranguing the crowds and urging the people to keep cool; the Entente was acclaimed; the liberal-minded Grand Dukes (Michael, Cyril and Dimitri) were enthusiastically received. A few shots were still being fired by the police, but the majority of them had fled or were in hiding, disguised as workmen or as women; many thousands of the bravest of them had been killed. The ex-members of former Governments were transferred to the fortress of St. Peter and St. Paul. Generals Roussky and Broussiloff, on behalf of their troops, signified their adhesion to the new *régime*; others hastened to follow their example.

The *Taurida* Committée and the Provisional Government, having reached an agreement, published a proclamation granting a general amnesty in respect of all political and religious offences and providing for liberty of speech, etc.; abolition of all restrictions based on social, ethnical and religious distinctions; the replacement of the police by a National Militia with elected chiefs; the election, on the basis of universal suffrage, of a Constitutional Legislature as soon as circumstances would admit. The death sentence, which only existed for political offences, was definitely abolished (16th March). The announcement was made by the French and English newspapers that the Revolution was an accomplished fact; their readers had been without news from Russia since 8th March.

XXXVI. The members of the Provisional Government were selected from amongst the intelligent and most honest of Russia's public men. Prince Lvoff, the most popular man in Russia, the organizer of the *zemstvos*, became Prime Minister and held the portfolio of the Ministry of the Interior. This Government was confronted with an immense task bristling with difficulties, which were enormously increased by the magnitude of the War on hand and the disorganization of the administration owing to the unfortunate practices of the fallen *régime*.

XXXVII. In this subdivision seven separate subjects are touched upon.

1. *The Imperial Family.*—The Grand Duke Michael, the Czar's younger brother, who had been nominated by Nicholas II. as his successor, declined the proffered crown and intimated that he would await the decision of the Constitutional Government yet to be formed; he thus spared his country the prospects of a Civil War.

Nicholas II. was removed from Mohileff to Tsarskoe-Selo, where the fallen sovereign and his family have been kept prisoners. Persons in the immediate entourage of the Imperial family were removed from their society. Some of them, notably Madame Wyrouboff, were imprisoned. Nicholas II. handed over his functions of Generalissimo to his uncle, the Grand Duke Nicholas. Other members of the Romanoff family were removed from the Army, although as an act of courtesy

Nicholas was addressed as Colonel Romanoff by officers of the Russian Army.

The immense apanage of the Imperial family was converted into national property, to await its disposal for the benefit of the peasantry by the Constitutional Government, when formed. The Czar and his family have been allowed to enjoy the use and benefit of their private fortune of some millions of roubles.

At one time it was thought that the peasantry would rise in favour of the Imperial family, but their devotion to their late Ruler fell to zero almost at once.

2. *The Army and the Navy. Discipline.*—Both in the Army and in the Navy there were some to whom the Revolution was not acceptable, but their resistance was promptly overcome. The outbreak of desertion and acts of indiscipline were the two most serious risks to be feared. Thousands of soldiers, even some at the Front, learning that they were henceforth *free*, believed, or pretended to believe, that they were released from their obligation to serve in the Army and returned to their homes. This homeward rush was accelerated by a rumour which was put into circulation to the effect that the Imperial apanage was to be distributed at once; it became, with many, a question of being in time to obtain their share of the Imperial estates. The Government met the situation by persuasion and not by violence; soldiers were given till the 14th May to rejoin their units. A great number of them returned to the colours spontaneously.

The Government and the Generals set their faces resolutely against the claim now put forward by the soldiers to choose their own chiefs. At the same time, the higher ranks were purged of the inefficients, the decrepits, those in the state of senile decay and the reactionaries; some, for example, Rennenkampff, were put under arrest.

The rank of officer could now be aspired to by every one irrespective of his social class; 300 Jews were immediately admitted into the Military School at Moscow.

The Baltic fleet, disorganized for a short time by acts of indiscipline, was led back into the paths of obedience without any shedding of blood.

General Brussiloff announced that the old discipline of the Army had been replaced by a discipline which, although less mechanical, was more conscientious in its estimate of the duty owed to the country. He did not think the offensive power of the Army had been lessened thereby. The future alone can decide this point.

3. *Industrial Truancy.*—One of the greatest dangers threatening free Russia was the possibility that munition factories might be brought to a standstill, owing to the extravagant pretensions of certain groups of workmen. The Government, seconded by the more reasonable among the Socialists, were able to induce the majority of munition workers to carry on. It was decided to continue work at the Poutiloff factories day and night; the workshops organized by the *zemstvos* were again set to work.

4. *Reprovisioning of the Country.*—The condition of the railways and roads was deplorable; the railway stations were choked. When the United States of America came into the War, a request was made

to President Wilson for 500 American railway specialists to be sent to Russia in order to reorganize the traffic arrangements on the railways. Great efforts were made to remedy the scarcity of food stuffs in the towns. At the end of three weeks, a considerable improvement had taken place in the situation and the prices of commodities had fallen. The Government formed 405 Regional Committees and charged them with the duty of ascertaining what stocks of supplies were available, to purchase and distribute the same. It is said that vast accumulations of supplies were discovered; this may have been due to an act of the late *régime*, promoted for the purpose of creating a scarcity in the markets, or this may have been due to the greed of the profiteers who wished to exploit the War situation for their own selfish ends.

5. *Nationalities and Religions.*—Poles, Finns, Lithuanians, Ukranians, Caucasians, Mohammedans and Jews all had suffered oppression under the late *régime*, although in unequal degrees. It was necessary to put an end to these persecutions which made intellectual Russians blush for their country.

The Provisional Government was not content merely to confirm the promises made to Poland. An independent Poland, consisting of the territories whose population was largely Polish, was proclaimed; it was granted a Legislature elected on the basis of universal suffrage. Poland remained bound to Russia "by a free military alliance" only.

The Lithuanian question is a complex one; the Lithuanians want *Home Rule*, but if this is granted them, so should it be to the Letts, the Ukranians, etc. The solution of the Russian Home Rule problem would appear to be met by the creation of Federal States, modelled on the type of the United States of America. The question is one that must be tackled in the near future.

In the case of Finland the suppression of the exceptional *régime* was all that was required, and this was done.

So far as the Jews were concerned, an immediate amelioration in their lot was secured by the annulment *en bloc* of the oppressive legislation of Catherine II. directed against this race; thus was secured the emancipation of 8 million Russian subjects by a single stroke of the pen (16th April).

6. *The Peasant Question.*—"Land hunger" is general among the Russian peasantry. After serfdom was abolished, 40 million peasants were required to support themselves on lands incapable of producing sufficient food to meet their needs; to-day this number has increased to 100 million. The industrial policy of Witte, beneficial in most respects, worsened, however, the position of the cultivators of the land. Russia exports too large a proportion of the wheat grown by her and hence her own population experiences periodical famines, sometimes local, sometimes general. Many remedies have been proposed; some reasonable and others unreasonable. In the advanced schools of political thought it has even been urged that the present landowners should be dispossessed without receiving any compensation, on the ground that in the XVI. Century the peasants were deprived of these very lands. Others again, although wishful to see the land transferred from the present owners to the peasants, are for equitable treatment

being meted out to the farmers; but the sums of money that would be required to compensate existing owners in the event of an expropriation would be so considerable as to render this treatment unfeasible. The Provisional Government has left the final decision of this thorny question to the Constitutional Government; but it may yet have to cope with a dangerous agrarian situation. Many landowners have already been forcibly ejected from their estates and the usurpations must sooner or later be checked *manu militari*.

7. *War or Peace?*—The Provisional Government hastened to assume responsibility for the high contractual obligations entered into by the fallen *régime* and announced that it would continue the War in accordance with the terms of the agreement of 4th September, 1914, to which Russia was a party. Kerensky, in agreement with Tchkheidze, has adopted the formula of a peace "without annexations and indemnities of any sort," and in this respect he appears to have departed from the War aims of the old *régime*. The Central Empires have not been slow to take advantage of the situation in Russia; *inter alia* Lenin, a revolutionary Russian living in exile in Switzerland, has been provided with every facility by the German Government to reach Petrograd *vid* Germany, in order to preach hatred against Great Britain and a separate Russian peace; however, he has been ill-received in many Russian quarters. The Russian Extremists have, in return for favours shown to their compatriot Lenin, somewhat naïvely issued an invitation to the Germans and to the Austro-Hungarians requesting them to follow the Russian example and to rid themselves of their Emperors and Kings, in order that they may be able more readily to become close friends; but the spectacle of German Socialism throwing in its lot almost entirely with the Government authorities and repudiating republican institutions has opened the eyes of even these Russian extremists.

Kerensky has denied that the Russian Socialists are, as stated in some quarters, willing to accept peace at any price. He has stated that the demands for a separate peace were more frequent under the old *régime* than since the Revolution. "The Socialists," says Kerensky, "are waging a defensive War, they desire no annexations, but are resolved not to take the first steps to secure peace." Nevertheless, he has accepted the principle of reparations and restorations, especially with regard to Poland and Belgium, but he repudiates all idea of *exactions*, without precisely defining his views on the subject.

The workmen delegates on the *Tauride* Committee are imbued with Marxist ideas alone; the Committee also contains soldier delegates, mostly peasants; these latter are not to be easily led astray. An antagonism between these two elements of the Committee early showed itself and is having a very salutary influence. The fact that the United States of America has come into the War will, it is thought, keep Russia up to the mark in loyally fulfilling her international engagements.

XXXVIII. The Russian Revolution was received nowhere with greater enthusiasm than in the United States of America, and it is probable that the fall of the late *régime*, execrated by all Americans, alone rendered possible the entry of this old democracy into the War as a belligerent. The view has been expressed in the *New York Nation*

(22nd March, 1917) that the Russian Revolution furnished the most complete guarantee that the solidarity in relation to the Entente cause will continue intact to the finish.

XXXIX. In reality, paradoxical as it may sound, autocratic Russia has been democratic for many decades. The ideas which have triumphed in the year of grace 1917 are but those promoted by Speransky in 1809, by the Decabrists in 1825, by the First Duma in 1905. These ideas have been fermenting for a long period, not only in Russian literature, but also in the Provincial and Municipal Unions. Russia has possessed a nobility, but no aristocracy. There has never been in true Russia any class in her social hierarchy corresponding exactly to the Prussian *Junkertum*. The ideas concerning *Liberté, Egalité, Fraternité* have been ripening in Russia as fruits natural to her clime; despotism has never been anything else in Russia than heavy gilt.

Russia is the only country in which one man greets another by the term *brother* without affectation.

History teaches that political liberty is as old in Russia as despotism itself. In the XIII. Century, the Republics of Novgorod, of Pskov were of the type of the Venetian Republic, in which citizens were, from time to time, assembled for the purpose of deliberating on matters of public interest by the tolling of the bells in the belfry; in those days princes who did not meet expectations were ruthlessly dismissed by these citizens from their high office. Later, a centre of autocracy was formed at Moscow; the Muscovites became the Prussians of Russia. The princes of Moscow fashioned their conduct partly on that of the Tartar Khans, whose revenue officers they were, and partly on that of the Byzantine Emperors, the Cesaro-papists.

By 1900 the Russian Government had finally developed into a full-blown autocracy under the heels of a police bureaucracy. The autocracy was of Eastern origin; the bureaucracy was purely German. This autocracy being smashed and this bureaucracy reformed, free Russia becomes the country of great possibilities. The hope of the well-wishers of Russia is that out of the present turmoil there will arise in the Old World an image of the United States of the New World.

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