THE PRINCIPAL DISEASES PREVALENT IN THE RUSSIAN ARMY (CENTRAL GROUP OF THE FRONT) DURING THE PERIOD 1914-1916 AND THE STRUGGLE AGAINST INFECTIOUS DISEASES.¹

BY PROFESSOR COSTANTINO KRZYSZKOWSKY.

Colonel, Army Medical Service, late Chief Medical Officer at the General Inspectorate of Health attached to the Supreme Command of the Russian Army.

Up till now, no data have been published regarding the diseases which were prevalent in the Russian Army during the War 1914-1918.

Nevertheless, on account of the nature of the conditions in which the Russian Army found itself during the War, these data afford a certain amount of interest, not only from the point of view of hygiene in general, but also and particularly from the point of view of war hygiene.

The writer of this memorandum who, himself, took an active part in the struggle against infectious diseases on the Russian front, is anxious to give his impressions regarding the struggle in question to his medical colleagues by means of these data.

Deprived of all news from Russia for almost three years, he has not been able to confirm them with the necessary statistical figures, and is, therefore, obliged to confine himself to making known those already in his possession when he was sent with a Mission attached to the Italian Army in the summer of 1917.

These data are official; they were supplied to the writer by the statistical branch of the Army Medical Inspectorate at the Russian front and with the permission of the said Inspectorate were communicated to the “Congress of Pirogoff” of Russian doctors held at Petrograd in the spring of 1916; and later, in 1917, during the mission of the writer on the Allied fronts, to the Army Medical Headquarters of Allied Armies.

Owing to lack of material, the author is also prevented from giving here a complete description of the entire Russian front.

On the other hand, from the point of view of epidemiology such a picture would not be very instructive, so different in every respect were the conditions prevailing on the various sectors of the front.

The description will be given here of only one group of Russian forces, that is, the group which at the beginning of the War was known as “North-western” and later, in the autumn of 1916, as “Western.”

In explanation of this it should be mentioned that at the beginning of the War the entire Russian front was divided into the following groups:—

(a) North-western Army group operating in East Prussia and in Poland.

¹ Extract from the “Annali d’Igiene” (Annals of Hygiene), Year XXXI, Vol. 2.
(b) South-western group operating in Galicia.
(c) Caucasian group.

In the autumn of 1915 the northern part of the first group was detached and in the autumn of 1917 the Rumanian group was formed, thus called after the zone of operations.

The writer served with the first group (North-western and later Western), therefore will only deal here with the contagious diseases prevalent in that group.

This group, which included from 1,200,000 to 2,000,000 men, operated in East Prussia and in Poland at the beginning of the War; in the winter of 1915 its front extended along the frontier of East Prussia along the river Bzura (west of Warsaw) as far as Lüblin.

At the time of the Russian retreat in the autumn of 1915, this front occupied the line from Dvinsk to Sarny; the extreme points of this front were not definitely fixed because, for strategical purposes, the Supreme Command united first to one and then to the other the contiguous points of the neighbouring groups.

The struggle against infectious diseases on the Russian front was carried on under extremely difficult conditions, very different from those existing in the Allied Armies.

To begin with, the different units were continually moving over an extended front; later it happened that sections which were operating in the Mazurian swamps for example, received orders to proceed towards the Carpathians. The movements were carried out in thinly populated zones, devoid of sanitary organization even before the War and where the incoming troops were obliged not only to take care of themselves but also to take care of the civilian population. If we add to this the unhealthy climate of the district (Mazurian lakes and Polish swamps) to which most of the soldiers from central Russia and Siberia were unaccustomed, the endemic presence of typhus and the accumulation of masses of troops in a zone where there were no large or provincial towns, the difficulties which the medical personnel of the Russian Army had to contend with will be clear to every epidemiologist.

ORGANIZATION OF THE RUSSIAN ARMY MEDICAL SERVICE.

Generally speaking the Army Medical Service was organized as follows: The administration of the services of a definite zone at the front together with its respective back areas was entrusted to one of the heads of the medical administration under the chief supply officer of the Army group.

The appointment and distribution of medical officers and reserve personnel and supplies for the different armies and units devolve upon the Chief Medical Officer. Without interfering with the regulations of the Medical Authorities attached to the General Staff of the Armies and Independent Units of the Groups, the Chief of the Medical Section of
The Principal Diseases prevalent in the Russian Army

the group could issue general dispositions with a view to co-ordinating the sanitary measures in the different units and armies of the group itself.

In the back areas the Chief had full powers to act in the struggle against infectious diseases and the local medical authorities both military and civil were obliged to report to him every case of infectious disease, if necessary, by telegraph, and carry out his instructions.

The department of the Head of the Army Medical Administration of the Army Group included the following executive units: a hygiene-sanitary section composed of different medical officers whose duty it was to distribute all available medical personnel, administrative services, material and according to the information received to follow the progress or increase of infectious diseases, allot doctors for special duties; a series of institutions such as mobile and fixed hospitals, the number of which varied and which were allotted from one sector to another to be placed at the disposal of the Supreme Command, according to the exigencies or requirements of this or that group. In addition there were reserves of medical officers, nurses and hospital orderlies; transportable and fixed laboratories; disinfecting trains composed of 5 wagons and carrying a personnel of 2 medical officers, 8 orderlies and a special disinfecting wagon of the usual type; 4 or 5 of these trains were placed at the disposal of each group; there were also disinfecting squads of a lighter type. In addition to this, representatives of the Red Cross and of public organizations (Union of Towns and Zemstvos) were attached but not subordinate to the medical administration of each distinct group, the latter being thus in a position to consult with them on every occasion and extremely advantageous in cases where it was necessary to take prophylactic measures for the civil population.

As a general rule, as soon as any case of infectious disease was reported in the Army, it was the duty of the medical officers to take the necessary measures to fight against and localize the infection. No action was taken by the administration of the Army Group unless the measures taken were unsuccessful or held to be insufficient.

In the Army, the administration of the Army Medical Section was entrusted to the head of the Army Medical Section of the Headquarters Staff.

Up to May, 1917, this post was filled by an officer (Colonel or Major-General) who was not a medical officer (!) assisted by a medical officer sometimes of the rank of General. A medical officer, specialist in hygiene, was attached to this department, having at his disposal a laboratory suitably fitted for chemical-bacteriological research, a disinfecting squad, and organizations similar to those of the Red Cross and the unions of towns and Zemstvos and a hospital for infectious diseases (mobile or fixed).

As a general rule these hospitals were located in the vicinity of railway stations and formed part of the Army Medical and War Organizations as a
whole, known under the name of “evacuation centres” (evacuation stations) exclusive to the Russians and which may only be compared to the British "casualty clearing stations." The “evacuation centres” of each single group were known as "main centres" and were situated near terminus stations, if possible, close to the front line or along the railway line of communication parallel to the front itself. In a word, they were medical centres composed of a certain number of mobile hospitals, a chemical bacteriological laboratory, a disinfecting room, a laundry, baths, medical stores, material for disinfecting linen. A reserve of medical officers and hospital orderlies was attached. An officer (non-medical) was in charge of these centres, assisted by a medical officer to deal with the technical medical administration of the centre. The work of these medical units was the evacuation of the sick and wounded toward the back areas.

The “main centres” come within the competence of the head of the medical service of the Army Group who had authority to change their position if he considered it advisable. These main centres also included tents for patients suffering from infectious diseases and finally acted as centres of inspection for the hygienic conditions prevailing on the railways and in the stations within the zone in which they were situated.

Similar centres were installed in the back areas, the only difference being that here the hospitals were not mobile but of a stationary type; they were known as “base hospitals.”

In some of these back areas (Vitebsk, Gomel, Bobruisk) there were hospitals for infectious diseases capable of accommodating from 2,000 to 3,000 patients each. These hospitals were of modern type, situated outside the town. They were composed of special wooden huts (to take from thirty to forty persons each), large chemical bacteriological laboratories, steam laundries, sewage disposal, etc. (at Vitebsk they had tanks for the biological purification of impure water). Finally, scientific meetings of the military and civilian medical officers in the zone were held at the “evacuation centres.”

Passing to the sanitary organization of the Army Corps, it should be remarked that the chief medical officer of the corps, “Corps Medical Officer,” enjoyed a certain autonomy with regard to the medical measures to be carried out. As a general rule a Surgeon-General was placed under the Army Corps Commander. Attached to him as adviser in matters connected with hygiene was the medical officer, head of the “hygiene-medical” section which consisted of a small mobile squad (five two-wheeled field-carts) whose duty it was to inspect the hygienic conditions of the zone in which the troops were distributed, the sources of drinking water and to notify the first cases of infectious disease and give instructions to the medical officers on matters regarding hygiene, etc. The section included hospital orderlies, nurses and two medical officers, namely, a senior medical officer—hygienist, as he is called—and an assistant medical officer, microscopist. In addition to these the chief medical officer of the corps had at his disposal, when required, private auxiliary organizations and special sections (hydro-mechanical, baths, food supply, etc.).
The chief medical officer of a division was a Colonel or Colonel Commandant who had under his command the medical officer, head of the disinfecting section together with the mobile room, universal type (Prochoroff method).

The disinfecting section was provided with the necessary materials, supplied without any formalities from the field-depots of medical supplies at the evacuation centres in the vicinity. One of the travelling hospitals of the division (there were two of them, each containing 210 beds, of which 200 were for the men and 10 for the officers) was reserved for infectious and suspect cases. The research work connected therewith was carried on either in the army corps laboratories or in the laboratory of the nearest "evacuation centre" (casualty clearing station). A few of the hospitals were fitted with a laboratory of their own.

There were also private auxiliary organizations attached to the chief medical officer of the division, which distributed hot food and drinks (tea) to passing troops and rendered great assistance in the struggle against the cholera epidemic among the refugees from Galicia during the retreat of 1915.

Such were the broad lines of the medical organization of the Russian Army; an organization adequate in itself and endowed with sufficient mobility and elasticity to explain the reason why Russia lost such a small quantity of medical material in the retreats from Eastern Prussia and Galicia. This is an example worthy of imitation by the other Allied Armies in which, on the contrary, there was always a tendency to render the medical services less mobile, with the result that no small quantity of excellent medical material was lost in cases of retreat owing to their inability for rapid evacuation.

GASTRO-ENTERIC.

At the beginning of the war, the personnel of the units in the Russian Army was excellent, composed as it was of young men who were well fed and still better equipped. To this may be added as a factor of no less importance the high moral and spirit of exaltation which was to be found in all classes of society, and in the Army where the War was looked upon as a war of liberation for their Slav brethren.

Infectious diseases began to make their appearance at the end of September, 1914, at first under the form of ordinary gastro-enteric disturbances caused by bad drinking water (marshes of Poland and East Prussia, tainted wells and rivers). Upon analysing the water in several East Prussian positions in the zone Margrabow, Lyk, Angerburg, the author nearly always found chlorine and nitrous acid, indicating that the water had been tainted by organic residue. When we consider the masses of troops constantly and rapidly moved through these posts, or how in certain places the regiments would only remain a few hours, it cannot
be wondered that a rigorous system of hygiene was not maintained in each separate locality.

Nevertheless, all the necessary precautions were taken by the medical officers to ensure the Army against infection by water-borne diseases and safeguard the purity of the springs.

All suspected wells were closed. For this reason sometimes there was an absolute scarcity of water; this was not surprising when, for example, in some villages where the housing accommodation did not amount to more than ten to twelve houses with three or four wells, forces consisting of several thousands of men with horses and baggage were obliged to encamp, the water became exhausted at once and the troops were forced to drink either the muddy water of the ditches or water procured from bogs and marshes. Everything was done to oblige the soldiers to drink water which had been boiled, or tea, but with little result. In this way the question arose as to whether it would not be possible in open warfare which entailed the rapid displacement of large masses of troops, to supply the soldiers with sterilized water. Unsuccessful attempts were made to supply the troops with chlorine tablets to disinfect the water. Henceforward everything gave place to psychological reasoning. The fear of infection did not trouble those who felt the morrow might bring death; for others the catching of a disease meant delivery from the hard life of war. Then there is the fact that the habits of the Russian masses are not hygienic. Finally, it was hard to expect anyone devoured by thirst to wait until the water had been disinfected apart from the fact that disinfected water, no matter what the method employed, loses in taste and freshness, which are fundamental qualities as regards the slaking of thirst.

In Poland, an attempt was made to remedy this situation by constructing "field canteens" all along the roads followed by the troops, where boiled water and tea were distributed night and day. Boilers containing boiling water and reservoirs filled with cold water which had been boiled were placed outside several of the field hospitals situated along the route followed by the troops. At the railway stations, boiling water or cold water which had been boiled was distributed free day and night. Even when a halt was made or the troops stopped to bivouac, endeavours were made at once to provide the troops with water which had been boiled.

In a word, everything was done to supply the troops with sterilized water. But with all this it was not possible to safeguard the troops from gastro-enteric troubles. This is not difficult to understand when we consider that in order to guarantee oneself against infection by means of water it was not sufficient, in view of the impure conditions of the soil and water in East Prussia and Poland, to confine oneself to the use of sterilized water alone as a drink; sterilized water should also have been employed for other personal requirements, to which nobody even gave a thought.

No small share in the appearance of gastro-enteric troubles was due to
contact with the local population. Although the daily food ration distributed to the troops was more than sufficient, the soldiers were always inclined to buy something extra, and it can be easily imagined how tainted the foodstuffs may have become owing to the lack of cleanliness of the population, the accumulation of refuse left behind by troops who had previously passed that way, and the enormous amount of flies and other insects. The authorities also endeavoured to fight against these factors but were not always successful. Out of the total number of troops, considerable per centage were affected with gastro-enteric diseases. The largest number of cases occurred during periods when movements of troops on a large scale were being effected and when fighting was in progress. During lulls when the troops remained more stationary (October, 1915 till the summer of 1916) the number of cases was reduced to one per cent, which was due to the fact that during periods of greater calm it was easier to supply the troops with sterilized water.

**Abdominal Typhus (Typhoid Fever).**

On account of the above-mentioned conditions, it can be easily understood how soon (September, 1914) cases of typhoid, with which 2·5 per cent of the troops were already affected in October, 1914, were to occur side by side with gastro-enteric troubles. In East Prussia (for example, at Lyk) entire hospitals were filled with cases of typhoid from the 10th Army. Although in peace-time typhoid does not give cause for serious apprehension as regards infection and death percentage, in war-time it becomes a regular plague in the Army and puts the Medical Services to a severe test. It renders the soldier helpless for several months and fills up all the hospital beds so urgently required in time of war.

The percentage of cases of typhoid between December, 1914, and January, 1915, was not very high; afterwards the epidemic abated, the percentage of cases being maintained between 1·6—1·2 per cent during the spring and summer of 1916; in October, 1916, it increased again. At that epoch anti-typhoid inoculations were begun and the epidemic abated, the percentage of cases remaining very low during the spring and summer of 1917 (0·2—0·4 per cent). There is no doubt but that great responsibility is attached to the War Ministry for sending soldiers to the front during the war who had not been inoculated against typhoid. The British Expeditionary force which landed in France consisted of a contingent of men nearly all of whom had been already inoculated and were immune from typhoid. In justification it may be quoted that at the outbreak of war the medical services of the Russian Army were not as independent as those of the British and in many questions of a strictly technical nature were under the orders of the non-technical military authorities.

The same thing happened in the French Army where the administration
of the medical services was entrusted to military officers without medical qualifications.¹

The Army therefore entered the war without having been previously inoculated; the inoculation of the troops was begun long after the first cases of typhoid had made their appearance. These examples are instructive and show the influence of certain ancient traditions by reason of which in the armies of olden times the administration of the medical side was with difficulty entrusted to medical specialists.

Medical war organizations, specially as regards military hygiene, are so complicated and require such particular knowledge and preparation that it is impossible to entrust the life and health of the soldier to officers of the general staff with impunity, without serious consequences to the Service.

The British Secretary of State for War, who understood this elementary truth, when forming the Army cadres, at once confided the administration of the Army Medical and Sanitary Services to medical specialists, creating an independent medical corps of these services (Royal Army Medical Corps). In this way the greatest scope was afforded for the exercise of initiative in the medical and hygiene services of the war, in accordance with the actual teachings of science, this being rendered all the more easy by the fact that the most important representatives of the science such as, for example, in the field of hygiene, Professor Beveridge, and bacteriology, Professor Leishman and Professor Wright, were called to co-operate in these services. And in fact, when visiting the British front and those of the other Allied Armies, we were able to state that in the British Army alone did the medical services attain the desired standard, all the modern teachings of science were applied to prophylaxy and clinical medicine. And this because, in the British Army alone, the medical officers are independent and free throughout to carry out the measures suggested by their own particular scientific competence.

When abdominal types appeared, the sanitary measures were increased particularly as regards the supply of water. In the autumn of 1915, as soon as the military operations assumed the character of static warfare, hydro-technical sections were immediately established, under the control of each Army Corps.

These sections disposed of technical experts and engineers whose duty it was to provide for the improvement of water reservoirs and construction of new ones. For technical reasons it was not possible to treat the water with chlorine since owing to the concentration of large masses of men on a relatively limited area and the frequent movements of the troops themselves

¹ For one result of this it is sufficient to read the words of the celebrated Belgian surgeon, Depage: "Have we not seen practitioners of high-standing and world repute serving as ordinary stretcher-bearers?" (Report of his journey to the French front, *La Presse Médicale*, 1918, 17-1, N. 4.)
large quantities of water could not be disinfected for lack of technical material. They had to be satisfied with water from the wells (Norton), every possible measure being taken to safeguard them against infection.

ANTI-TYPHOID INOCULATION.

There is no doubt but that the most radical measure to have taken would have been to inoculate the Army. Unfortunately, however, the system of bureaucracy and routine which prevailed in the Army Medical Administration up to the outbreak of war, not only prevented any steps being taken to introduce this important prophylactic measure, but also even during the War, when the experiment tried by the British Army must have already been known to the Army Medical Administration at the Russian Ministry for War, there were sceptics who had doubts as to the harmlessness and utility of preventive inoculation! One of the most stubborn opponents of preventive inoculation, for example, was the Director of the Medical Services of the Armies of the South. It required all the efforts of the reserve medical officers and, in particular, of the doctors attached to private organizations, as the Union of the Zemstvos (particularly those under Professor L. Tarassiewitsch and Professor Carafa-Korbut) who organized an extensive propaganda in connexion with the necessity for vaccination on a large scale, to enable this to be put into practice.

Preventive inoculation was favoured by the late Czar Nicholas II., who was always deeply interested in matters connected with hygiene in the Army.

At the end of the summer of 1915 orders were issued whereby inoculation against typhoid were obligatory in the Army in the field. On the Western front (Western Group) which is the subject of this report, the practice of inoculation began in December, 1915, and by March, 1916, nearly all the soldiers and most of the officers had been inoculated.

Thanks to the assistance of the Chief Medical Officer of the Western Group, Surgeon Lieutenant-General V. Hubbenet, the campaign against typhoid was progressing favourably. Considering that this was the first experiment of the inoculation of troops in a body, made during a period of military activity and trench life and that it was still opposed by a good many sceptics, the best possible measures were taken to provide against any eventuality which might occur to discredit vaccination. Therefore, the duty of performing the inoculations and the supplying of the vaccine were entrusted to a special Commission composed of Army medical officers and doctors belonging to private institutions posted near the Medical Administration of the Group. Commissions composed of competent medical officials were formed and attached to the Army General Headquarters. In the Army Corps and equivalent commands these organizations and the control of inoculation were entrusted to the medical officers, experts in
hygiene, belonging to the respective corps. In this way it was possible to inoculate almost two million men and great faith was reposed by the troops in this prophylactic measure. The supplying of the vaccine was undertaken by the Panrussa Union of the Zemstvos (i.e., Provinces) with the concurrence of all the more important bacteriological institutions in Russia.

The vaccine supplied by the union was of the Kolle type and contained an agar culture of Eberth's bacillus. The bacteriological laboratory of the War Ministry supplied vaccine cultured in bouillon, Wright's method. This last vaccine was insufficient as regards quantity, causing in addition frequent local reactions generally of a fairly intense nature; for this reason it ended by being used solely in the back areas.

All vaccine, before being distributed for use, had to pass through a control laboratory at Minsk where the purity was tested, and the absence of living bacilli certified and experiments carried out upon human beings. It is true that it was soon admitted that the action of the inoculation varied according to whether it was used in the back areas or in the front line; nevertheless the tests were continued and only after it was ascertained that it was capable of checking the disease in the case of men of all categories, was it distributed for use in the Army.

Two injections were made (a double quantity of vaccine being injected the second time) with an interval of seven to eight days between each. The results obtained and the scientific observations made were published in the "Scientific Meetings of the Medical Officers of the Western Army Group." One of the Armies (2nd) adopted on its own initiative the practice of simultaneous inoculation against typhoid and cholera which gave excellent results. The action of the bivalent vaccine was not so intense as that of the monovalent (Dr. Vosckresensky).

As already stated, almost all the troops forming the group had been inoculated by March, 1916, as a result of which the number of typhoid cases during the Spring and Summer of 1916 fell. At the end of the summer re-inoculations were begun.

On the whole the results obtained by inoculation correspond in every respect to those ascertained by us on the French front.

It is not without interest to note that for the most part the officers refused to allow themselves to be inoculated and that only a few of the doctors submitted to it.

(To be continued.)