Dumfries

During the late Russo-Turkish war, while serving under the orders of Lord Blantyre and the Stafford House Committee for the relief of the Turkish sick and wounded soldiers, I was stationed, during the winter of 1877-78, in the town of Erzeroum, and had ample opportunity for observing the causes which led to the great mortality which took place there. I purpose in the following pages to give a short account of the diseases which prevailed and which occasioned the mortality, and to add a few remarks on cases of unusual interest which came under my notice.

In no part of Turkey, was the mortality during the late war, greater than in the town of Erzeroum. In

In time of peace the usual population is about 50.000, but during the war a great number of the wealthier classes fled at the approach of the Russians, and at the time of which I speak, it was about 40.000. The Turkish army which was forced to retire into the town numbered about 30.000. So that the total population of the town and fortifications was 70.000

The troops entered the town in the beginning of November and it was surrendered to the Russians in the beginning of March. During that time the Official returns admit that not fewer than 15.000 died, but their figures were notoriously below the mark, and Competent authorities asserted that about 18.000 regular soldiers died in the town from November to March. Among the civil population were many men capable of bearing arms

arms, and they formed a not unimportant military element and were exposed to the hardships of war almost as much as the regular soldiers, and among them the mortality was equally high. Nor did the Christian population escape, for tho not exposed to the dangers on the field and in the camp, the diseases, which became epidemic throughout the district soon attacked them and caused many deaths.

Altogether, of the whole number who were resident in the town in the beginning of November, roughly estimated at 70000, not fewer than 25000 were buried within the walls in the following five months. At one time, in the middle of January, when the sufferings of all were most severe, I was told by an officer high in authority that four hundred persons were being buried daily

daily! This mortality is exceptional even in a besieged town, but can, in a measure, be accounted for by the utter neglect of all precautions to secure the health of the troops and to prevent, or limit the spread of disease.

Originally the troops were in Excellent Condition and their physique would compare favorably with that of British soldiers, but by the time they were driven into Erzeroum they were exhausted by the hardships of a long and fatiguing Campaign, their food was insufficient, both in quality and quantity - their Clothing was ragged and torn - quite insuitable for the cold Armenian winter, while their shoes were worn out. They were discouraged and dispirited by a succession of disastrous defeats, and latterly they had been in constant retreat before their enemy,

Enemy- Their retreat into Erzeroum was a complete rout and they arrived there utterly disorganized and spiritless.

Many had suffered from dysentry ague, diarrhoea and other complaints incident to the country and to Camp life, and they had received no medical attention, and were in a wretched state of exhaustion

It was not surprising then that men in such a condition should readily be attacked by disease, and that they should soon succumb to it.

The Hospital accommodation in Erzeroum proved quite inadequate for the requirements of the army. In the earlier part of the Campaign, when the hard fighting was at some distance from the town, only the more lightly wounded were to be met with in the Hospitals - for there was no regular transport for the

Wounded

wounded and only those whose wounds were comparatively slight and permitted of travelling were able to reach the Hospital. But as the fighting came nearer the town and ultimately actually took place on the fortifications, wounds of every degree of severity were admitted in such numbers as to quickly over crowd the existing hospitals. Temporary Hospitals had to be improvised and all the available buildings were taken and speedily crowded. When however in addition to the existing causes, Cold, hunger and epidemic disease appeared, every hospital, permanent and temporary, was terribly over crowded and the sufferers had to take their chance in the houses of the inhabitants; and the whole medical organization - if it had ever existed - completely broke down.

The Sanitary State of the

The town was throughout of the most deplor-
-able description. Even in time of peace
the town is in a filthy condition - drain-
-age except by open sewers is unthought
of, and, as in all Turkish towns, the dogs
are the only scavengers. The sewers run
in the middle of the streets - perfectly open -
the sides of the street shelving down towards
the centre, and forming the sides of the
drain. Into this gutter refuse of every
description is cast - to decompose, and
cause the most abominable stench, to be
eaten by dogs, or to be carried off as
best it may - During the seige, matters
were of course, worse - The influx of such
a number of men, who, when not taking
their turn of duty on the fortifications, were
billetted among the inhabitants, increased
the quantity of refuse - Numbers of Artillery
and Cavalry horses fell dead in the streets
from

from sheer exhaustion and want of food, and their carcasses. after being stunned, were left to lie and be gradually removed by the dogs. Altogether the state of the streets and of the drains is simply indescribable, and no effort was made by the authorities to improve it. The overcrowding among the civil population certainly encouraged the spread of disease. During the cold weather, numbers of people from the surrounding district crowd into the town, and for the sake of warmth, as many as possible occupy the same room. To these were added the soldiers who were distributed among the townspeople when not on duty in the forts.

Under these circumstances it is not, I think, surprising that disease broke out with such severity and that

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that, having broken out, it should find so easy a prey among both soldiers and civilians. The absence of any precaution on the part of the authorities undoubtedly encouraged the spread of infectious disease. Isolation was never thought of, much less attempted, the separation of the different forms of fever was evidently thought unnecessary and it was no uncommon thing to see in the Turkish hospitals bad cases of typhus lying among the wounded. The whole object of the medical authorities seemed to be to get rid of the sick and wounded as quickly as possible so as to make room for fresh cases.

Of all the diseases existing in Erzeroum during the winter I believe that <u>Typhus fever</u> was the most

most prevalent and most widely spread, and that to it was due a great proportion of the mortality

Typhus Fever. Typhus is I believe endemic in Erzeroum during the winter months.

About the beginning of December one or two isolated cases were noticed in the English Hospital. These were carefully separated and every precaution taken to prevent its spread in the hospital - but in spite of everything it rapidly spread. and soon began to appear among the wounded, who had lain in the hospital for some time, so that ultimately it became perfectly impossible to separate the cases. The only ones who escaped seemed to be those who had already passed through it. The rapidity of the spread of the disease throughout the town was appalling, and soon every hospital was

was attacked. Shortly afterwards the disease broke out among the civil population with equal severity. I afterwards learned that Typhus was quite as prevalent among the Russian troops who were occupying the villages round the town, and the mortality among them seems to have been quite as great as it was within the city.

With the approach of warmer weather the severity of the Epidemic began to abate, and by the middle of March the disease seemed to have exhausted itself and comparatively few cases occurred among the soldiers, tho' it still lingered in the houses of the inhabitants, and the Russians after their entry continued to suffer severely.

The character of the fever was particularly malignant. It was impossible to keep any accurate register of the cases passing through my hands, but I should say

say that the death rate, among those who were under my care, was not less than from thirty five to forty per-cent.

The Case of the late Dr. Pinkerton of the Glasgow University, who unhappily died of Typhus, may be taken as an average example of the disease as we saw it.

The following is a short account of his illness taken from full notes made daily in his Case. He was seized on the afternoon of the 28th December 1877 with a severe and prolonged rigor - up to that time he had enjoyed Excellent health - The rigor was followed by headache, nausea, General pains and fever. He had a strong presentiment that it was Typhus and that he should not recover: and was Consequently much depressed. During the night he was restless and unable to sleep. and next day all the symptoms had

had increased in severity. For the next four days he continued to get worse and was exceedingly prostrate and weak. The treatment had been an emetic of Zinc. Sulphate at the commencement, with careful dieting, regulation of the bowels and Chloral to procure rest. Latterly Brandy was given in small quantities as the prostration was so great and seemed out of proportion to the other symptoms.

On the morning of the fourth day the typical Typhus Eruption appeared and was copious and natural. His appearance was noted as being heavy and bloated - face being flushed - He was also perspiring rather freely. There was delirium, of a quiet character - Pulse 108. Temperature M 103°. E 104.5

On the fifth day all the symptoms were more severe and the weakness greater - Delirium continued - the tongue became brown

and

and dry - The perspiration was clammy and profuse. The Eruption well out but rather dark. Pulse 108. Temperature E 105°. The bowels were much relaxed.

On the Seventh day he had sunk into a typhoid state and his case was evidently hopeless - there was constant restless muttering delirium - subsultus and carphology - profuse cold clammy perspiration - lividity of extremities &c &c.

Brandy and stimulants were given freely but without effect and he sank into a Comatose state, which gradually deepened till his death on the ninth day.

From the Commencement the prostration was the marked feature and all efforts were directed to keeping up his strength, but in vain. The profuse perspiration was in all cases an exceedingly bad symptom - and I do not remember any cases

cases, in which it was marked, recovering

Diarrhoea was an exceedingly frequent complication in the Typhus, as seen in Syperonn, and was very difficult to manage and generally occurred in the fatal cases.

The type of fever throughout was essentially a dynamic and stimulants were required in almost every case. As a rule death took place on the ninth or tenth day; but frequently, in subjects already exhausted by previous illness it took place much earlier - and in many instances I believe that the death was caused by Typhus fever before the eruption came out and before the disease could be diagnosed - this especially occurred in cases where men suffering from frost bite or hospital gangrene were attacked.

Convalescence was slow and tedious the patients being left in a state of extreme debility

debility and emaciation. Diarrhoea was very common during convalescence and required great care in its management.

Among the medical staff, as might have been expected Typhus fever was very common. Of our own party, numbering five in all. all except myself were attacked. I had already had typhus in the Fremock Infirmary. but with the one exception made good recoveries. Of the thirty six medical men serving in Kyrenia with the Turkish army and at work in the early part of November, twenty four died before the surrender of the town to the Russians! In the first fortnight of January, twelve medical men died. all from typhus. a few of the remainder died from other causes, before the epidemic had broken out with such terrible severity.

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Hospital Gangrene. Next to Typhus Fever the disease which caused the greatest mortality was undoubtedly Hospital Gangrene

In the earlier part of the Campaign before the Hospitals became so overcrowded and when, for reasons before mentioned, the wounds were of a comparatively slight description, there was an almost entire absence of infectious disease. When however, the hospitals became overcrowded to such an extent, the natural results followed and Erysipelas, Pyæmia and Hospital Gangrene broke out

Of the two former diseases there were surprisingly few cases, but the last when it had established itself attacked almost every case and was never completely got rid of.

When the first few cases appeared, having never seen the disease before I confess that I did not fully appreciate its significance and attributed the sloughy

looking condition of the wounds which is so characteristic of the disease, to some unusually bad state of health of the sufferer. Its occurrence however in other cases roused my suspicions and I soon became painfully aware that I had Virulent Hospital Gangrene to deal with, and from the day of its first appearance to the closing of the hospital it was never altogether absent - Anything more discouraging to the Surgeon or more dreadful to the wounded I cannot imagine. In spite of every care to prevent its spread by contact, almost every wound in the Hospital was attacked more or less severely - and in an astonishingly short time what had been a healthy wound was converted into a foul sloughing sore and the general health of the patient seriously damaged.

As soon as I recognised the

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the disease, I proceeded to deal with it energetically - all the existing cases were isolated, the wards fumigated, the bedding destroyed and every measure used to secure its extinction - In spite of all, the disease continued to spread - new cases from the central government hospital, with wounds already affected, were constantly being admitted and isolation became perfectly impossible. Our stock of Carbolic acid became exhausted and the city being besieged it was impossible to procure more - Bandages and lint also ran short and it became at last absolutely necessary to rewash and reapply both the bandage and the lint - This proved a very difficult matter, for after what was probably a very imperfect washing it was impossible to dry them owing to the scarcity of fuel, and on exposure to the air they froze as

hard as leather and had to be used in this condition. Our difficulty in dealing with such a terrible disease under such circumstances may be imagined and it will not be wondered at that the disease spread so rapidly and so extensively.

No breach of surface - however small - was exempt from the disease - from the slightest scratch - a frost bitten toe - the exuberant granulation over necrosed bone, to the most extensive wounds - all were liable and unless vigorous measures were at once taken - and too often in spite of them - the life of the sufferer was sacrificed. Over and over again it happened that cases of amputation which, after the greatest care and anxiety, had been brought almost entirely round and which were perhaps over looked for a day or two, were seized by the disease, and a promising stump

- Stump was converted into a sloughing
Shrinking mass in a surprisingly Short
time.

Almost invariably the first symptom
complained of was pain. It was quite different from
the pain usually felt from a wound and was describ-
- ed as of a gnawing character. Rigors often
accompanied the onset of the disease but were by
no means constant - a rise in the pulse and temp.
- erature immediately took place and formed through-
- out a very good index to the severity of the attack
The temperature was only taken with any regular-
- ity in a few cases of special interest and
presented no unusual feature, being rather
irregular and often high. In one case specially
noted of hospital gangrene attacking the
stump of a forearm and proving fatal
it was as high as 107°7.

The general health rapidly
failed after the disease had set in with any

severely - typhoid symptoms setting in when a large surface suffered. The tongue was as a rule foul and thickly coated from the first and towards the close became brown and dry. Appetite failed and emaciation became marked.

One peculiarity of the disease was the expression of the patient. The whole features indicated intense suffering and anxiety - the face becoming pinched and drawn - and the expression was quite characteristic of the disease, so that one by merely looking at the patient could almost tell that he was suffering from gangrene.

Diarrhoea was frequent and very intractable.

Almost simultaneously with the first appearance of the constitutional symptoms the aspect of the wound changed. At first & often soon after the seizure the surface was noticed to be dry and glazed & the previously healthy discharge ceased. Very soon the pink healthy granulations were replaced by

by greyish points, which as the disease advanced coalesced and covered the whole surface of the wound. The whole seemed like a diphtheritic membrane spread over the granulations

Very quickly this membrane seemed to thicken and eat its way deep into the wound and to become more foul and unhealthy. At first there was no discharge but after the disease had extended a dirty sanious discharge was established; later on the membrane softened and was given off in shreds, being tough and stringy. The edges of the sore soon suffered and became raised and undermined. The surrounding tissues became red and oedematous, and with the advance of the disease seemed to dissolve away. From the first the granulations bled easily but when the disease had fairly established itself, the slightest touch caused bleeding, often to a considerable extent

The damage done to a wound by the disease was terrible - within a few days the whole original shape had disappeared - muscles nerves and vessels were exposed in succession and often the bones laid bare - In some cases this went to a frightful extent - in one, in particular, of a bullet wound in the shoulder - the scapula, vertebral column and ribs were exposed before death. Death several times occurred from the large vessels being destroyed by the gangrene causing secondary haemorrhage, which could only be controlled by ligature ~~near~~ farther up the limb - the ligatures not holding at the seat of the disease. The coats of the arteries however seemed to resist the action of the disease more than the other tissues for frequently the arteries were seen pulsating when all the other tissues had been destroyed. The rapidity of the spread of the

the disease was most striking, a wound being destroyed and the neighbouring parts involved in a very short time. Of course in debilitated subjects the rapidity of the progress was much greater.

Recovery took place gradually, the first evidence being a cessation or diminution of the intense pain, with the appearance of healthy granulations springing up among the tough stringy shreds which were being cast off. Under appropriate treatment the whole slough was removed and replaced by healthy granulations and a discharge of healthy pus re-established. Simultaneously with the local improvement, the constitutional symptoms diminished. Relapse was frequent and great care had to be exercised in the subsequent dressing. Healing generally proceeded more rapidly after the attack subsided, the granulations being more active and healthy.

It was not uncommon in cases in which there was more than one wound, for one to be affected with the disease and the other escape – it was also noticed that one part of a wound might be covered with the slough and the rest remain healthy, but in these cases the attack was never very severe.

The management of such a disease in the circumstances in which it occurred was by no means easy. Undoubtedly the most important points in the treatment of Hospital Gangrene are Ventilation and strict cleanliness. It was often remarked that cases whose wounds were in the upper parts of the body and allowed of their going outside, were less readily attacked by the disease and more easily recovered than those whose wounds confined them constantly to bed. Ventilation was therefore insisted on, tho it was difficult to carry

Carry out in the very cold weather. All the rooms in the Hospital were fumigated more or less thoroughly by the evaporation of Carbolic acid for an hour or so daily. Isolation is most desirable, but in our case it could not be properly effected. The dressings were as far as possible destroyed and care taken to prevent the communication of the disease by sponges, instruments &c &c.

The treatment which proved most successful was entirely directed to the local affection. When the cases were seen early and where the disease was not too extensive the actual Cautery, thoroughly and freely applied, was very effectual. But in many instances the disease recurred during the separation of the Slough caused by the Cautery. In cases when the extent of the surface affected was at all great it was found that the shock caused by such severe measures was too

great to be borne by the patients most of whom were in a state of extreme prostration. Nitric acid and other Caustics were tried with more or less benefit but the plan which appeared to suit best was the frequent dressing of the wounds and the free use of Carbolic acid. In the earlier stages the wounds were dressed twice daily and at each dressing portions of the slough forcibly removed. The wound was thoroughly washed with a strong solution of Carbolic acid (1-20) the solution being thrown thoroughly into the slough by a strong syringe. "Marine Lint" was a most useful application as it sorted up the discharge and kept down smell. Under such treatment in favourable Cases the whole slough was removed in shreds and the healthy tissue exposed & the wound took on a healing action. When our stock of Carbolic acid was exhausted, we

we had no suitable substitute, but a lotion made with Chloride of lime, of which we had an abundant supply answered the purpose tolerably well, tho' it proved rather irritating and had to be used weak.

Along with the local treatment various Constitutional remedies were tried but by themselves were of no avail. The medicines which did most good were Quinine in full doses with Tincture of Perchloride of Iron. and some form of Opium. The hypodermic injection of Morphia was much used and proved a great boon. Nourishment of every description with free use of stimulants was called for in almost every case.

Amputation was tried on two or three occasions where the frost bitten stumps of the limbs were attacked by the disease but it was most unsuccessful, the disease appearing very soon in the stump.

Ligature of any vessel at the seat of disease was with us absolutely useless, the coats of the vessels being sooner or later involved - pressure or ligature nearer the trunk were the only means of checking the haemorrhage.

I am inclined to think that the disease is in the first instance local and that in the majority of cases the Constitution is only secondarily affected. But we noticed many instances where there was no wound but where patients were attacked by an incontrollable diarrhoea and died with the same symptoms as those suffering from Hospital Gangrene. It was a noticeable feature in such cases that the expression of the face assumed the same peculiar care-worn and anxious look which was so characteristic of Hospital Gangrene.

The presence of such a disease in a Surgical Hospital has a most de-

depressing effect on all the inmates of the hospital. Our wounded soon came to know the disease and saw its danger from the sufferings of their comrades they were constantly on the watch for it in their own cases and used eagerly to point out to us its first symptoms. To the Surgeon the disease is most discouraging and in circumstances such as we were placed, it was doubly so - for we were at its mercy and from want of appliances could do little or nothing to check it, and had to see most promising cases of operation over and over again carried off. Latterly we dreaded even making an incision and had to refrain from operating except in cases of urgent necessity.

Cancrum Oris. While Typhus fever and Hospital Gangrene were so prevalent in the Hospitals of Syracuse, eight cases of Cancrum oris came under my care.

The first was the case of a man recovering from Typhus fever who was suffering from parotid Bubo. A small phlegmonous mass appeared at the angle of the mouth and rapidly spread and involved the whole cheek - which in two days sloughed and separated: the unfortunate man presenting a terrible appearance - and four days after the first appearance of the disease death took place. Subsequently seven other cases appeared, independently of any other disease and in all the result was fatal. In all, the course of the disease was the same, its first indication being a small brawny swelling generally on the inside of the mouth, and

and rapidly involving the whole cheek, causing sloughing of all the tissues. Along with the local disease, extreme typhoid symptoms were present from the first, in all the cases - death took place in about four days from the Commencement of the disease - in some cases before the slough had time to separate. In none of the eight cases was there any previous breach of surface, and in some there was even no apparent disease tho the patients were in a state of exhaustion from fatigue, exposure and want of sufficient food. The resemblance of Cancrum Oris to Hospital Gangrene is very striking. I saw several cases in the Turkish Hospitals and the Surgeons seemed to think that the disease was infectious, but in the cases that came under my care nothing occurred to lead me to think that it was so.

No treatment seemed to be of

any avail, the cases rapidly passing from bad to worse. Nitric acid freely applied to the whole affected part did not appear to have the least effect in checking the advance. Generous diet and free stimulation were indicated - while Morphia in considerable quantity was required to subdue the pain which appeared most severe.

Scurvy was a most annoying complication and in the last weeks of the siege every one suffered more or less from scorbutic symptoms. The food supplied to the troops was, during the earlier part of the siege, of very fair quality and tolerably abundant - It consisted of rice, which forms the main part of the diet of the Turkish soldier - a small quantity of mutton and coarse grain - Latterly however it was necessary to limit the supply as the inhabitants also had to be supplied with

with rations and the troops soon began to suffer from the scarcity and bad quality of the food.

It was impossible to obtain either Vegetables or fruit. Among our medical stores was a small quantity of Lime Juice - but not nearly enough to supply the Hospital and ward off the Scurvy.

Scorbutic symptoms first appeared among the wounded. Their wounds ceased to heal. The granulations, previously healthy became lazy and fungous. Haemorrhage was frequent and very difficult to deal with, while they became anaemic and weak. Among the sick the symptoms were not so evident. Tho many suffered from spongy gums - and from the characteristic hard brawny discolorations in the calves of the legs - the part presenting the appearance of a bad bruise.

We could do little for the disease in the absence of the means of treatment. So far as possible the diet was

improved. Citric acid was tried. It was found that when given in large doses for a considerable time it appeared to have some little effect. Potash salts were also given and had a fair trial but absolutely without benefit.

Frost-Bite — The Winter in Armenia is always very severe, but that of 1877-78 was exceptionally cold believe. Severe frost set in in the end of November and continued till the middle of March. While snow covered the ground from the beginning of November till April. During the winter the Thermometer was occasionally observed - The cold was most severe in the month of January when the thermometer registered on an average, during the night, 30° below Zero. F. - or 62 degrees of frost! and this too in the town - On the fortifications the cold was much more severe for

for they stood higher and were more exposed to the cold winds which swept across the plain. During the day the sun was wonderfully warm and bright, and as a rule the atmosphere was clear and bright. During the excessive cold- that is in the month of January- the mortal-ity from all causes was highest- notably so in the cases of Typhus fever. Many deaths from cold alone took place. The soldiers were miserably clad. They had no flannels and their uniforms were worn out and rayed. In this state they had to sleep in tents on the fortifications, and took their turn at sentry and outpost duty. A night attack was expected constantly and had taken place on two or three occasions, and consequently their duties were very severe. Profound sleep, deepening into Coma was always the forerunner of death in such cases- and it was no uncommon sight in the early morning to see men pulling

their Comrades about and vigorously thrashing them to awaken them from the fatal sleep

Sentrys and men on outpost duty were frequently found standing in the deep snow, frozen to death. I well remember, early one morning seeing the figure of a man outside the line of trenches apparently in the act of defecation - During the night he had gone out to relieve his bowels and he found him stiff and dead, having fallen asleep and died in that position.

A few cases of frost bite of the toes occurred in November and December but they were not severe and as a rule did well. Later on however the cases became more severe - In several cases both legs as far as the knees were gangrenous on admission - while it was quite common to have men with both feet destroyed. One Exceedingly severe case was admitted to the

the English Hospital - a Captain of Cabalry who had a short time previously been exposed all night and had both his hands up to the wrists - both his feet to the ankles and his nose destroyed. Ito a rule we only got the patients after the gangrene had become more or less complete. I only remember of one case in the first stage - a man met me in one of the forts and showed me his hand which was white, cold and insensible - like that of a dead man - I rubbed it vigorously with snow and afterwards wrapped it in cotton wadding and in a few days he was well again but Vesications and desquamation took place and one or two little black gangrenous spots remained on the knuckles. This man told me that beyond the pain caused by the sensation of intense cold he suffered nothing and

only noticed his hand by accident. But he complained of a burning, tingling pain when life was returning to his hand. This was the universal Experience - after the first sensation of cold the gangrene was painless and it was only by the loss of feeling and power of motion that the man discovered his condition. There was almost no Constitutional disturbance till the gangrene had become thoroughly established. In every Case the gangrene was dry - the parts becoming shrivelled up and mummified - Very soon the line of separation appeared and the parts separated with wonderful rapidity.

The Constitutional symptoms were well marked while the process of separation proceeded. In the treatment of these cases it was always a question whether nature should be left to complete the process or the patient should be subjected

subjected to the shock of a double amput-
-ation. In patients who were tolerably strong
and robust it appeared the better treatment
to allow nature to complete the process in
the first instance, separating the dead parts
as they became detached with scissors and
afterwards by some operation covering in
the stumps - The great risk was the liability
to Hospital Gangrene - The whole limb was
generally enveloped in cotton wadding soaked
in a solution of Permanganate of Potash
which was frequently renewed - By this
means smell was kept down and the
gangrenous parts separated satisfactorily.
Nourishment and tonics were always neces
-ary to keep up the strength while the
process was going on - This mode of treat-
-ment proved successful in many cases
satisfactory stumps remaining.
In patients however whose

already Exhausted by fatigue and exposure and whose strengths did not seem sufficient to withstand the drain necessary for separation. Amputation of the gangrened parts seemed to give the best results tho' the great majority of such amputations were fatal. As in other Cases of wounds, Hospital Gangrene was the Cause of most deaths. Amputations which would have otherwise done well in all probability, were carried off by this disease. As it was 4 discharged from the English Hospital three Cases in which double Symes Amputation had been done.

The effects of cold were also seen in cases of Pneumonia, Acute Rheumatism and Nephritis. Acute Pneumonia frequently occurred among all classes of the inhabitants - more particularly in the latter part of the winter and beginning of Spring - As a rule

Rule, uncomplicated Cases did well and made good recoveries - Phthisis was by no means common among the Turks and very few cases passed through our hands among the Circassians however it and other strumous diseases were very prevalent and we had occasion to see many cases during our stay in Armenia.

A few cases of Acute Rheumatism were admitted into the English Hospital but they presented no feature of unusual interest. Several cases of what seemed uncomplicated acute Nephritis occurred - all from exposure to cold and without any history of previous renal disease - Suppression of the urine, anasarca and uraemic symptoms were the prominent features and most of the cases ended fatally -

Diarrhoea was very prevalent in all throughout the winter - Almost

Everyone suffered more or less - the disease being of a dysenteric character. and required constant care and watching

During Convalescence from other diseases it proved a most troublesome complication and was most difficult to check. In men, exhausted by fatigue and exposure it was very common and proved very often fatal - Typhoid symptoms set in early and no treatment seemed to check the discharge

In these cases the men rapidly sunk and the expression of the features and general course of the disease was very similar to Hospital Gangrene - It almost seemed as if they were really suffering from that disease without the local manifestations.

Early in December a man under treatment in the

the English Hospital for a flesh wound in the breast, (received during an out-post skirmish), was attacked a few days after admission, by Small Pox. To be quite sure, the patient was seen by both English and Turkish doctors who agreed that it was undoubted Small Pox. The Eruption became confluent and the man died. Where he caught the disease is a mystery — and an interesting fact for Epidemiologists. He had been serving with his regiment the fortifications and had in no way been exposed to the disease. I made diligent enquiry in the other Hospitals and throughout the town, but no other case had been seen — and so far as I could learn there had been none for some time.

Strict Isolation was kept up and great Care taken to prevent the spread of the disease and no other case occurred

throughout the winter.

About the middle of November one of our number, Dr Guppy took ill and died of what was to us a new form of fever. Unwillingly and against our better judgements we were driven to the conclusion that it was rapid and acute enteric fever; but later on the same fever appeared in the hospitals and two of our party were seized but recovered. From the cases I saw and from enquiries among the inhabitants I came to the conclusion that it was due to Malaria and endemic in the district

The inhabitants and native doctors recognise the disease, but among them all fevers go under the name of "Typhus" They regard it as infectious - and look upon it as exceptionally fatal. The following is a brief description gathered from hearsay and from my own experience in

in the Cases of my three Comrades are in hospital. It commences like other acute diseases with rigors sickness general pains and fever. The rigor is severe and pro-longed and is followed by vomiting and profuse diarrhoea. Prostration is early and quite out of proportion to the duration of the disease or the severity of the fever. The temperature throughout is very irregular but usually high. with no marked evening Exacerbation. It rises and falls without apparent cause. (being as high as 106° and 107°F. in Guppy's case) and falling nearly to normal. It rises without rigor or other change in the disease. Diarrhoea is a Constant feature and generally Excessive - the motions being thin and fluid but without blood or mucus. Vomiting and great gastric irritation was very common from the

Commencement. The tongue is loaded and foul - becoming towards the close hard, dry and cracked. Thirst is great and appetite gone. Death took place in most of the cases about the fifth day and recovery which was apparently by crisis on the seventh. Convalescence is very slow and tedious - in one of our Cases - that of Williams, our interpreter. Typhus fever came on during convalescence. Relapse is common. Delirium comes on late in the disease; and a very curious fact was noticed that it remains after every other symptoms has disappeared. This was specially noticed in the case of Dr. Fetherstonhaugh who was very ill with the fever but was able to be up and about on the tenth day but he was quite delirious and wild for some days after - tho perfectly well in every other

other respect. The same thing was noticed in several other cases. I noticed no eruption in any case. Quinine except as a temporary remedy was absolutely ineffectual and in no case was the fever shorter than seven days. The treatment which seemed most successful was support and stimulants as was indicated by the rapid and extreme prostration and the early appearance of Typhoid symptoms.

A great number of wounded passed through our hands in Erzeroum. The majority were from bullets tho' we saw many injured by shell, bayonet and sabre.

In Bullet wounds the appearance is quite what one should expect. Flesh wounds where no very important tissues had suffered did well as a rule and call for no special remark, except that early and free incision on the first appearance

of "tapping" in the course of the wound is of the utmost importance - Rest and Cleanliness are the important points in the treatment. When the bullet has fractured a bone the effect is very different.

What was perhaps the most important point in this Class of cases is the Extent of the injury by the Conical bullet. The External appearance of a limb when the bone has been fractured by a Conical bullet is no indication of the severity of the injury. and in all these cases we found that the bone had been splintered much more extensively than was apparent by mere External Examination. and over and over again we had occasion to see, where an attempt to save the limb had been made, how impossible it was

I believe that in all cases where a large bone such as the humerus or the

the femur is fairly struck and the bone comminuted, amputation at once, gives the best chance of life to the patient - for we found that the shaft was generally split longitudinally for a considerable distance.

When the bone has been fractured by a bullet glancing off and when no great comminution exists the bone may unite and the limb be saved. We had a great many cases of such fracture of the Humerus and by care and attention to drainage useful arms remained. In the severer cases amputation was performed, and, considering everything, with fair success. Of many cases of Compound fracture of the thigh I only saw one case do well - Such an injury is one of the most severe in military surgery - and in the great majority amputation gives the only chance of life - With us no case of amputation of the thigh recovered - the operation

being either too long delayed and the patient exhausted or the shock of such an operation in patients already debilitated too great.

One case made good progress but was carried off by Hospital gangrene. The one case of recovery was that of a healthy young officer, whom I attended in his own house. The femur had been fractured in the middle third the exit wound being in the back of the thigh. Extension by weight and pulley was kept up. The necrosed bone gradually removed and free drainage from the posterior wound maintained.

In four months the bone had united and a fairly good limb resulted, but I think waxy disease had set in from the prolonged suppuration.

Wounds of the joints invariably required amputation or excision.

I did two excisions of the head of the

the humerus, one of which was successful a good sound arm with strong joint resulting. I had two resections of the knee joint, but both were fatal – two of the elbow, one being fatal from diarrhoea and exhaustion.

In fracture of both bones of the forearm amputation was required – but when only one bone was injured the limb was saved.

Gunshot Wounds of the hands and fingers were exceedingly common and in many cases the injuries are undoubtedly self inflicted to escape duty. In these cases there was always evidence in the shape of grains of powder driven into the skin and general bruising and scorching of the tissues. The men explained their wounds by the fact that their right hand was the only part of their body exposed while fighting in the trenches and this

undoubtedly was the case in many instances

Wounds of the head were in most instances caused by fragments of shell - those caused by bullets were I suspect in most instances rapidly fatal - on the field I saw on several occasions dead bodies in whom the bullet had evidently penetrated the skull.

A few sabre wounds were also seen but they were generally comparatively superficial

I had six cases of fracture of the skull from shell wound - in four the bone was depressed, and in two the brain substance was lacerated and protruded. The two latter died - but all the others recovered

The treatment adopted was non-interference, except when specially indicated - The following is an example of a very severe case of compound depressed fracture, recovering even under very unfavourable circumstances. A man about thirty years

years old was wounded at Kars during the final assault on the fortress, by a fragment of shell. He was struck on the crown of the head with great force the blow rendering him insensible for some time and causing a large wound. He lay in an hospital in Kars for a month, the wound not healing and was then sent off along with a large number of wounded prisoners with orders to find their way to Erzeroum - about a hundred and twenty miles distant.

The weather was very severe and the roads almost impassable from snow and all the wounded thus discharged suffered great hardship so much so that fully seventy-five percent died on the road. This man presented himself at the English Hospital about six weeks after the receipt of the injury; he was much emaciated and weakened by his illness and utterly exhausted by his long and arduous

journey. It was found that there was a large wound, circular in shape about the size of a five shilling piece situated on the crown of the head - It was covered by unhealthy granulations and here and there showed signs of commencing hospital gangrene - At the bottom of the wound and overlapped by the skin and granulations lay a large surface of necrosed bone depressed and fixed below the level of the cranial bones - It pulsated with the movements of the brain - and on pressure from above a quantity of unhealthy pus oozed out from beneath it.

It was found on closer examination that there was distinct tho. slight facial paralysis on the left side and there was distinct left hemiplegia, affecting both arm and leg.

The paralysis was very slight but quite apparent, tho' the patient himself did not notice it and suffered little beyond the pain of the wound and weakness. The

The wound was enlarged, and projecting edges of bone, which prevented the removal of the necrozed piece, sawn off, and with considerable difficulty it was removed. (The removed piece is enclosed with this paper and will give some idea of the extent of the injury)

The surface of the dura mater was found covered with unhealthy granulations and pulsating strongly - The wound was dressed carefully with Carbolic lotion - but in a few days was covered with the slough of Hospital Gangrene. For some time the man was in great danger, but with very careful and frequent dressing, the wounds assumed a more healthy Character and in a months time had almost completely cicatrised - The paralysis gradually improved and ultimately he was dismissed quite well pulsation being visible and the parts giving the appearance of the fontanelle in a

Childs head.

We had several cases of severe wounds of the face and mouth - and found them very difficult to deal with - the suffering caused by such wounds is very great from the inability to swallow. The stomach pump is necessary in many cases. In one man a bullet had passed through the base of the tongue - from one angle of the jaw to the other and oedema of the glottis followed. rendering tracheotomy necessary: this case ultimately made a good recovery and the tracheotomy tube was removed. Chest wounds were not so common but proved very fatal when the lung was injured. Hermetic sealing was tried, and only in one case, when the lung was opened, was it successful. The erratic course which a bullet very often takes was well shown by some of the

the Chest wounds. The external wounds seem to indicate that the bullet has passed right through the thorax yet no serious symptoms follow, showing that the bullet must have followed the course of the rib and not entered the cavity of the thorax

Penetrating wounds of the abdomen were not uncommon after one of the assaults on the town. In one fight the enemy had gained possession of one of the forts and had to be driven out at the point of the bayonet and a considerable number of abdominal wounds resulted. In many the bayonet had done such mischief that recovery could not be expected, the abdominal wall being ripped up and the bowels protruding and injured. Most of such cases died on the field before they could be removed to the

hospital. The two following cases are good examples of recovery from penetrating wounds of the abdomen.

During the assault on the earth works on the 9th of November a young Captain of infantry while fighting at very close quarters was struck by a bullet and was removed into the house of a friend close by. Three days after he received the injury he walked into the English Hospital. It was found that the ball had entered the abdomen about an inch and a half above the umbilicus and about an inch and three quarters to the right of the median line and made its exit at a corresponding point in the right lumbar region. On being wounded he suffered great pain and was partially collapsed but recovered so far as to be able to walk to the hospital.

On admission there was no pain on pressure over the abdomen except

Except in the region of the wound. She suffered scarcely any discomfort otherwise and was wonderfully free from Constitutional disturbance. Her bowels had moved and her appetite was good. The wounds were fairly healthy looking. From the anterior one issued pus and a thin yellowish fluid having the smell, and to some extent, the appearance of fluid faeces. To make sure that the discharge was faecal Tincture of the Perchloride of Iron was given and the next day the discharge was distinctly black -ened. The wounds were carefully dressed with Carbolic lotion and thick pads applied and retained by a broad bandage

Light food was given and the patient kept slightly under the influence of Opium. Under this treatment the discharge gradually diminished and four days after being seen first was not discoloured by the

iron. The wounds became superficial and gradually healed, the patient being discharged to duty in perfect health.

During the same fight in the course of a bayonet charge a young healthy looking man - a Kurd - received a bayonet wound in the abdomen, a bullet wound in the left forearm and another in the right thigh. He was admitted to the English Hospital the same evening when it was found that a piece of omentum when spread out about the size of the hand protruded from an irregularly shaped wound of small size in the left hypo-chondrium. The left radius was badly broken and comminuted about its middle and there was a severe flesh wound on the lower and outer aspect of the right thigh.

The patient suffered greatly from all his wounds, but principally from his arm

arm, from which there had been consider-
-able haemorrhage. The Omentum was
found to be so firmly nipped by the
contraction of the abdominal muscles that
it could not be returned. Even with
Chloroform it was impossible to get it back
without enlarging the wound. Accordingly
a Carbolised Catgut ligature was applied
and the protruding portion cut away. The
edges of the wound in the abdomen were
stitched together and the wound dressed by
a large pad and a firm bandage - which
was allowed to remain undisturbed for
several days. Opium was freely given and
the diet restricted. For some time
it was doubted whether the arm could be
saved and had it not been for the
abdominal complication it would probably
have been amputated. The loose pieces of
bone were carefully removed and the

arm placed on a straight splint.

The abdominal wound healed with very little trouble - there was for some days local peritonitis which gradually passed off and in about ten days the wound had healed. The wound in the thigh also healed and after a long and tedious illness the radius united firmly, and in spite of a very bad attack of Hospital gangrene and profuse suppuration the patient was dismissed well with a very useful arm after about four months stay in the hospital

The use of Antiseptic measures in Military Surgery has been the subject of some discussion in late years. There can be little doubt of its great utility in surgery - both civil and

and military, but from my experience I doubt very much if it can ever be carried out in its present form in time of war. The immense number of cases passing through ones hands, the hurry and bustle of a Military hospital and the peculiar nature of the wounds met with, render the carrying out the details of the antiseptic treatment, on which so much depends almost impossible. It is acknowledged how difficult it is in civil surgery to make sure of making a compound fracture, produced by external injury, antiseptic. How much more difficult must it be then in a case where a bullet has fractured the bone, and is perhaps lodged in the wound, and where pieces of clothing &c are carried into the wound.

In hospitals in the rear no doubt, with a sufficient staff and all the necessary appliances, cases of excision and amputation could be treated antiseptically, but in the front

with ambulances I do not believe that it will be ever possible to carry out the treatment as it is at present, with any hope of success.

A great deal may be done however by the free use of Carbolic acid and other agents.

Carbolised tow is of very great service - and in the form in which it was supplied to us viz "Marine Lint" it was most useful.

It absorbs discharges and keeps down smell and applied above the lint with which the wound is covered it forms a soft and comfortable dressing - Frequent syringing of wounds with Carbolic lotions and with a strong syringe, tho' perhaps irritating, is of great service

In my cases of amputation, seeing how impossible it was to get early union of the flaps. And that in almost all cases the stitches had to be removed at the first or second dressing, owing to the tension which so quickly occurred, I gave up the use

use of sutures altogether and only inserted one or two to keep the flaps in position and not with a view to secure early union In this way free exit was given to the discharge and the whole wound could be more thoroughly and effectively washed out. By this plan the discharges were kept comparatively sweet and the result was altogether more satisfactory than when an attempt was made to keep the flaps accurately in position from the first. When the wound had begun to heal straps of plaster were used and answered the purpose very well.

The disposal of the dead came to be a question of the greatest importance in Erzeroum. and when it is remembered that 25000 bodies had to be buried within a comparatively small

area this will not be wondered at.

The ground was frozen so hard that deep pits could not be dug and besides it was covered with snow.

It was found that the bodies lay only a few inches below the surface. During the hard frost which lasted all winter no bad results followed. but when the snow began to melt and the moisture got at the bodies they began to swell up and decompose. In many places they protruded through the ground and the burial places presented a hideous sight. The dogs soon found out the exposed bodies and tore them out of the ground. Matters were in this condition when the Russian troops occupied the town and we represented to the authorities what the the consequences would probably be when the hot weather set in if some measures were not taken to

dispose of the decomposing bodies. At first they proposed to take them up and cremate them, but the fanaticism of the Turkish population would have been roused by such a measure. Ultimately they set to work and had deep pits dug and unearthed most of the bodies and buried them again with large quantities of quick lime. This proceeding had the desired effect and all the bodies were in this way got rid of.

The foregoing presents, in a very incomplete and imperfect manner, some idea of the medical history of the siege of Sebastopol.

The great fault is the want of accurate statistics, but the Turkish medical authorities entirely neglected figures, and I myself was so overwhelmed with work, between my Comrades and the hospitals, that I could not, except in cases of exceptional interest take notes. A very

Great drawback was our want of knowledge of the language - We had interpreters - but one was almost constantly sick and the other could scarcely be induced to enter the hospitals for fear of infection so that they were practically useless - In this way an immense amount of useful and interesting information has been lost - What I have been able to gather I have endeavored to reproduce in this paper.