MEDICAL AND SURGICAL NOTES FROM MESOPOTAMIA.

BY

G. GREY TURNER, MAJOR R.A.M.C.(T.).

PART I.

THE WEATHER.

I WENT out to Mesopotamia with a British general hospital and landed in Basra in the beginning of April, 1916, and I am now writing at the end of December, so that my experience is of the dry season and not of the rains. True, after I first arrived there were some thunderstorms, with just enough rain to introduce me to the universal, intolerably slippery mud of the winter, but from April 15th to the end of October one day succeeded another with unfailing blue sky, bright hot sun, and an average maximum temperature of just 100° F. Very rarely a cloud appeared, and now and again there were penetrating dust storms, though usually there was not even a breeze, for the Shamal (north-west wind) almost completely failed. October, November, and December may be looked upon as the autumn. During these months it was hot in the sun and a topee was necessary, but the early mornings and evenings were beautiful, and those who were first introduced to the climate at this time thought it well-nigh perfect. The nights were cool and sometimes very cold, and in December the temperature once dropped to 42° F. On November 5th we had our first shower since April, but there was no heavy rain until December 26th. The monotony of the summer weather was only relieved by the interest taken by some of us in the temperature. I kept records of the maximum and minimum for the whole of my stay, and the main facts of my observations are set out in the following table. My thermometer was of English make, but not registered at Kew, though, on comparing it with others, variation was negligible. I lived in an E.P.I.P. tent with a double roof and with either the sides down or all the doors open. The thermometer was hung about half-way up one of the tent poles, and though the conditions were not such as would be selected for permanent meteorological records, the temperatures shown are those in which one actually lived and are thus of especial interest.

Record of Temperatures in Mesopotamia during Nine Months of 1916.

Month and Number of Days on which Observations were made.	Highest Maximum.	Lowest Maximum.	Average Maximum.	Lowest Minimum.	Highest Minimum.	Average Minimum.
April ... 18 days ...	100	74	87	60	74	65
May ... 30 " ...	118	92	102	67	80	75
June ... 27 " ...	118	90	105	70	84	75
July ... 22 " ...	122	101	112	74	86	79
August ... 17 " ...	118	104	108	70	83	75
September, 29 " ...	112	93	103	58	77	66
October, 30 " ...	100	83	89	50	66	58
November, 30 " ...	89	67	81	46	73	57
December, 24 " ...	74	42	66	42	59	46

The range of temperature was often remarkable, and on September 13th was as much as 47°, that is, from a maximum of 108° F. to a minimum of 61° F. It is interesting to compare the temperatures in July with those recorded at home for that month. (The latter are observations made at Newton-on-the-Moor, Northumberland, and published in a local newspaper. I am informed that the summer of 1916 in England was unusually dull and cold.)

Temperatures in July, 1916.

	England (Northumberland).	Mesopotamia (Amara).
Average maximum	66° F.	112° F.
Average minimum	50.5° F.	79° F.
Highest maximum	79° F.	122° F.
Lowest minimum	42° F.	74° F.
Greatest range	29° C.	46° F.
Rainfall	3.72 inches	None

Unfortunately I was not able to compare systematically the wet and dry bulb temperatures, but on what I call a typical "Basra day" in December the record gave 82° F. for the dry bulb and 80° F. for the wet. This amount of saturation alone has been proved to raise the body temperature,¹ and this question of humidity had undoubtedly a great deal to do with the frequency with which heat exhaustion and heat-stroke occurred.

The continuity of the temperature throughout the twenty-four hours was extraordinary, and as the following records show, at all times of day and night it is very hot.

May 18th.				July 28th.			
A.M.		P.M.		A.M.		P.M.	
6.30 ... 80° F.		1 ... 114° F.		6.45 ... 86° F.		1.30 ... 113° F.	
7 ... 82°		1.30 ... 115°		8.15 ... 100°		3.30 ... 110°	
7.45 ... 86°		3.30 ... 110°		11.30 ... 114°		4 ... 108°	
11.30 ... 110°		5.30 ... 102°		12 noon ... 114°		4.45 ... 107°	
		6.20 ... 96°				9.15 ... 92°	
		7.45 ... 88°					
Maximum for 24 hours ... 115° F.				Maximum for 24 hours ... 114° F.			
Minimum for 24 hours ... 75° F.				Minimum for 24 hours ... 82° F.			

Paradoxical as it may seem, it is nevertheless a fact that the heat is not always worst when the temperature is highest, and the most trying time was undoubtedly the moist heat of Basra in May and June. During these months perspiration literally poured from one. It began with the exertion of drying after the morning bath and continued until tardy slumber temporarily buried in oblivion the discomforts of a wet pillow, for there was "no freshness in the dawn," and each succeeding day brought the same discomforts. The constant state of perspiration in which one lived was a great trial, and in spite of the heat I found it a comfort to stand in front of the open fire which we used for sterilizing our drinking water. I believe that this extraordinary perspiration is partly paralytic, but even so it is a wonderful example of the power of the sweat glands, and it would have been interesting to try and measure the amount of fluid lost in this way. As a result renal secretion was much diminished, and most people only urinated twice or thrice in the twenty-four hours.

This excessive loss of fluid may also have accounted for the low blood pressure which I found to prevail. In a small series of observations made on comparatively healthy men the average was only 87½ mm. of mercury, and in the case of an officer whose pressure in England was never less than 135 mm. of Hg the manometer never registered more than 120 mm. Quite apart from the serious effects of the heat it is generally depressant, and vitality and resistance are both at a low ebb.

The temperature was usually highest about 2 o'clock in the afternoon, and it was between then and 3 o'clock that cases of abnormal pyrexia occurred among the patients in the wards. In fact it was so common that medical officers got into the habit of visiting their wards about that time, and quite often some case of dangerous pyrexia was discovered. For those who were up and about the most trying time was in the evening from about 5.30 to 6.30, and it was then that one appreciated the benefit of a little alcohol.

Food is of immense importance, and the principal difficulty is to secure enough variety. For a time vegetables were very scarce, but hospitals will become more or less independent as more attention is paid to gardens. Some of the Indian hospitals at Amara grow enough vegetables very considerably to augment the resources of the commissariat. This is a very important matter, for scurvy has been rife among the native troops. The lack of local grown fruit is very disappointing, for one rather expected luxuries in the Garden of Eden; but perhaps it is as well, for all who have lived for any length of time in the East warn one against eating uncooked fruit, and the temptation to do so would be great. Raw fruit is very liable to set up diarrhoea, which is always dangerous, and there seems to be a definite relation between the consumption of raw melon and the onset of cholera. Where dangerous infective intestinal diseases are so common it is a good rule to eat only such food as has come off the fire.

The quantity of liquid one consumes is almost as interesting as the quality, and while at Basra I never drank less than a gallon a day. I am a great believer in hot water as a thirst quencher, and used often to drink as much as a pint once or twice in the course of the morning. One of the effects of the heat is to cause loss of weight, and it was surprising how the "large men" of our unit diminished in size, though we all suffered to some extent. Even the Indian troops felt the heat very much; at first this may seem strange, for in many parts of India the heat is as great and as trying as in Mesopotamia, but the conditions under which they live in their own country lessen the discomforts materially. Nearly all the troops in Mesopotamia lived under canvas, but buildings either of stone or brick or mud with few windows, and those properly shaded, are the only suitable dwellings. In fact, in the hottest weather even the natives dig big holes in the river banks resembling caves, into which they retire as a means of shelter from the sun. The superiority of buildings as a protection from the heat was well illustrated on a day in June when the temperature in my tent was 100° F., for in the ante-room of the operating theatre, which was a building with thick brick walls, verandah, and double roof, the thermometer only registered 87° F. Of course, the living arrangements were more or less improvised, and though the patients were housed in good huts the staff and personnel for the most part lived under canvas, and neither punkas nor electric fans were universal.

The question of exercise during the hot weather is interesting, and one certainly requires very much less than at home. At Basra I did a good deal of walking, and I think that on the whole I did myself harm. But it is quite possible to work on the hottest days, and I was accustomed to operate and to work in the wards or *post-mortem* room with a temperature of 110° to 120° F., and I am sure one feels the heat less when well employed. The way the cooks were able to work, in spite of the heat and exposure, was a constant source of astonishment to me. Of course abundance of sleep is essential, and the natives always rest from about 11 a.m. to 3 p.m. during the hottest part of the year. I found it difficult to sleep in the afternoon, but it is surprising how much refreshment can be secured by merely resting with nothing but a towel across the pelvis, and, if very hot, a wet cloth tied round the head. The mental attitude has much to do with the way people tolerate the climate, and those who suffered most, and sometimes seriously, were often of a nervous, irritable disposition, and all through the depressing weather men of the Mark Tapley stamp were an invaluable leaven in the unit. There are many physiological points of interest to be worked out, and any one condemned to spend a hot season in the country might devote his spare time to their solution. For instance, the trivial amount of haemorrhage following the extraction of teeth, etc., led me to believe that the blood coagulated more readily than at home, and a small series of observations in the estimation of the "blood coagulation time" confirmed my suspicions.

INSECTS.

Of all the minor troubles none are so distressing as the insect bites, and, owing to their liability to become infected, they often lead to grave disability extending into

weeks or months; men were often in and out of hospital all the summer for no other reason. In my own case some infected bites on one of my feet were two months in healing, though I was never off duty. The insects are legion, but of all the many varieties probably only a small proportion bite, for which we were devoutly thankful.

It was a great and pleasant surprise to me to find that the men were not infected with lice, for after what one heard of the conditions in France I expected this "minor horror" to be very troublesome. Of course my experience has been limited to the hot weather, and I am told that in the winter lice did flourish. In the hot season the men are very lightly clad and their clothes are perforce exposed to the very powerful rays of the sun, which we know is too much for these parasites. Is it not Shipley who records the experience of a private who told him, "We strips and we picks 'em off and we places 'em in the sun, and it kind o' breaks the little beggars' 'earts"? But all through the hot weather body lice were very common among the native troops, and this small matter leads me to remark that in many ways the native and British troops are not comparable, and generalizations applicable to both cannot be drawn from the observation of either. When as consulting surgeon I had opportunities of seeing numbers of natives the differences in their resistance, attitude to disease, incidence of certain disease, etc., struck me very much. Of course, these are matters which must be very well known to all medical officers who have worked in India, but to the new-comer they are a surprise.

In one of the camps in which I lived the flea was responsible for an immense amount of discomfort; one officer of my acquaintance caught no fewer than thirteen on or about his person before breakfast one morning! But, of all the minor horrors, fleas are the most amenable to treatment, and Keating's powder, properly used, is a specific. It should be dusted on the socks and in between the folds of the putties, when it will furnish almost absolute protection. I do not know when the flea season commences, but it usually comes to an end about the middle of June. In the spring of 1916 they were only an inconvenience, but since the appearance of plague at Basra they may prove a very real danger.

Sand-flies are fearfully troublesome in certain localities, and I have never been so miserable as when the victim of their attentions, for the loss of sleep which they entail tends to make one very depressed. If it is not possible to sleep away from where they abound, a good deal can be done to discourage their attentions by smearing the face, neck, and ears with eucalyptus vaseline, and by wearing socks on both feet and hands, taking great care to tuck the pyjamas into the top of the socks. A solution of lysol freely daubed on the exposed parts and sprinkled on bed and pillows also helps to ward them off, but I was never fortunate enough to discover a specific, though I tried all the plans recommended. Though their bites are exceedingly sharp, the irritation only lasts a very short time, but they may give rise to phlebotomus fever, from which we have nearly all suffered, an irritable temper during convalescence being pathognomonic.

Mosquito bites are serious because of the malarial parasite which they may convey, but the most uncomfortable bites are those of some insect which produces a swollen area that may remain irritable for days. They may be infected sand-flies or infected mosquitos or some entirely different variety, but whatever their identity their effects may be serious. In my own case these bites produced large oedematous areas, which were attended with recurrent irritation for as long as a week at a time. The irritation usually came on when the part was exposed to the air, and, in fact, the only real relief is to keep the part protected from exposure. It is almost impossible to prevent scratching, and this almost invariably breaks the skin and introduces sepsis. Frequently ulceration developed, and some cases were attended with cellulitis and lymphangitis. I have often seen men covered with these sores; they were very slow in healing. The minor sepsis met with in this country is of a very resistant sort, and the defences of the body are at a low ebb.

Every gradation in the effects of sepsis was represented, and the relation between infection and resistance is

sometimes so low that a general infection may occur. I saw fatal septicaemia arise as a complication of what was apparently but a trivial sore.

The patient, a big well-built man of 22, was admitted with cellulitis of the foot, which had followed ulceration produced by wearing his boots continuously in the trenches for a fortnight. From the time of admission he was very ill, and had a high temperature. In spite of free incisions the ankle-joint became infected, and after a rigor the leg was amputated. Though he improved a little as the result of the intravenous injection of eusol death occurred a week later.

A mild and chronic form of pyaemia is quite common. Abscesses at first develop in the course of the lymphatics running from the affected part, but later subcutaneous abscesses form in distant areas as the result of the blood infection. Such patients have long-continued pyrexia and get exceedingly thin, but ultimately recover as the infection becomes attenuated. Sometimes a blood infection persists, and I am sure that it was the cause of the various unexplained cases of spontaneous joint effusion met with. In all such cases there was some antecedent history of septic sores which had been long in healing. I used to think that there was no leishmaniasis in connexion with these bites, and though I never saw what might have been a Baghdad boil, many of the cases were exactly like the descriptions of oriental sores or veldt sores, and just before leaving Amara I saw cases in which the Leishman-Donovan body was found. They must be looked for in the softened foci before ulceration actually occurs, or the discharge must be washed away from the ulcers and material selected from beneath the overhanging edges, for secondary staphylococcal infection very soon occurs. Quite apart from the question of leishmaniasis there is nothing like taking these troubles seriously at the outset, and it often pays to take a man into hospital for what may look like a very trivial condition. After treating any cellulitis by fomentations, etc., I found that there was nothing better than a few applications of iodine to sterilize the surrounding skin, followed by a simple spirit dressing, great care being taken never to let the part remain uncovered. Granulating sores must be treated *secundum artem*. Doubtless many other plans of treatment will do equally well, but this I found to answer admirably.

There is a manifestation of minor sepsis that is characteristic and very troublesome. It begins as a pustule, usually on a finger. At first it looks most trivial, but within twenty-four hours it is surrounded by an area of induration, but without much pain, lymphangitis, or constitutional disturbance. After another twenty-four hours it either bursts or has to be incised, disclosing a large slough, which separates, leaving an equally large granulating area. The process often extends to the bone, and the amount of sloughing is out of all proportion to the severity of the initial lesion. It was very common on the fingers of nurses and ward orderlies. This type of sepsis ought to be very carefully worked out bacteriologically, but the laboratory accommodation has been in such demand for other and more important things that, so far, it has not been possible to deal with this interesting subject as it deserves.

The seasonal variation among the insects was very remarkable. This is very well understood in connexion with those which have been the object of close study, such as the mosquito, but it may also explain the incidence of other diseases that are not yet recognized as being insect-borne.

Of other types of vermin I have said nothing, for I have not seen the bites of scorpions or tarantulas. We had men bitten by jackals. Naturally jackals are shy creatures; when they run amok they are most probably hydrophobic, and those bitten by them had to be sent for treatment to the Pasteur Institute at Kasauli (India).

MALARIA.

The types of disease varied very much in the few months of our stay. At Basra we had a large amount of malaria, but it is always common there at certain seasons of the year, and the up-river natives speak of it as "Basra fever." Every precaution was taken to protect the men from this scourge, but in a district which is riddled with creeks, and which during certain seasons is inundated, the difficulties of the sanitarian are great, and the most impor-

tant prophylactic measures are personal. The men were furnished with mosquito nets, and the orders were that each should take 5 grains of quinine daily. Anybody who has used a net will know how difficult it is to be sure that it is always efficient, especially as it adds so much to the intolerable stuffiness of the nights, and many authorities express grave doubt as to the value of quinine as a prophylactic. If the latter is to have a fair chance it is essential that it should be taken in an assimilable form. I made some observations on various kinds of tablets, and found that a very popular variety did not even disintegrate in water after twenty-four hours, and that the addition of an amount of hydrochloric acid equal to that in the gastric juice, or of a "ration" of lime juice, made very little difference. Our O.C. then issued the quinine in solution, and although it was very nasty I think there was some evidence that it helped to diminish the incidence of malaria among our own staff. In all cases of pyrexia malaria must be first excluded, and in a busy hospital with between thirty and forty admissions a day this was a very big undertaking for the pathologist. Some of the cases of malaria were of a very severe type, and there were quite a number of the malignant and cerebral varieties. Though it is recognized as the most protean of diseases, its manifestations were a surprise to most of us. Gastric irritability with persistent vomiting was common, and such patients could not take quinine by the mouth. Many times the great value of intramuscular injection was demonstrated, and no case of tetanus occurred as a result. Fortunately tetanus is rare after wounds in Mesopotamia, and most medical officers had never seen a case, but as the ground over which we are now fighting has been fouled since the spring of 1916, the conditions may prove different. I always injected 15 grains of the acid hydrochloride into the vastus externus muscle, and never saw any ill effect, either local or general. The situation appears to me to be much better than either the deltoid or gluteal region, for there are no considerable vessels or nerves that might be injured. Many patients with the cerebral type of disease died in spite of treatment, and there is no doubt that many so-called cases of heat-stroke were of this nature. In some cases the pathologist was able to demonstrate the parasites in the cerebral vessels after death. Though it was common to find the spleen palpable, the "ague cake" was rarely met with, and is only to be expected in very chronic cases. In one man who died of malaria I found a large collection of blood in the peritoneum, due to spontaneous rupture of the moderately enlarged spleen.² We had many illustrations of the lighting up of a latent malaria as the result of some operative interference, and this possibility must always be borne in mind and provided for by the exhibition of quinine. After any operation an unexpected rise of temperature is an indication for a blood examination rather than a sign of alarm.

CHOLERA.

Cholera, fortunately, was only sporadic, and there have really not been many cases. Though it is often taught that it is entirely a water-borne disease, many men with tropical experience are inclined to suspect the common fly as one of the main factors in its spread, and, as with all these diseases, attach the greatest importance to carriers. The treatment of cholera by the transfusion of hypertonic saline was attended with considerable success. These patients are so denuded of body fluids that they are positively shrivelled up, and the immediate effect of supplying some pints of fluid to the tissues is very remarkable. I have often heard the method spoken of disdainfully, but I feel sure that the criticism is not fair, and if there has been a want of success it is probably because the careful directions of Leonard Rogers and his co-workers have not been carried out. As cholera is more or less endemic on the Tigris it is indeed remarkable that it did not occur in epidemic form when we consider the possibilities of infection and the ignorance of the soldier in matters sanitary. Frequently men filled their water bottles at the nearest creek rather than go a little further or wait a little longer for a purified supply. Even in hospital I intercepted a patient going to the creek in order to fill a feeding cup for one of his fellows. On another occasion an orderly of more than average intelligence was found carefully sterilizing a piece of ice by washing it in

permanganate solution before allowing it to melt in his drinking water! It is also very difficult to prevent men patronizing the native vendors of cold drinks, sweetmeats, and other commodities, which are all potential germ carriers.

It is difficult for any one at home to realize the amount of pollution to which the creeks of this country are subjected. They are at once the sole water supply and the main sewer. Every sort of abomination is thrown into them, and it is the commonest of sights to see offal floating on the surface. Our water was pumped from the creek near the hospital, was then sedimented and chlorinated in water carts, and was finally boiled. For the latter purpose two tanks were employed, and no water was used until it had boiled for half an hour. The result was a most beautiful water, the only difficulty being that it could not be easily cooled; but this was a very small price to pay for a pure supply. Later on this difficulty was got over by storing the boiled water in large chatties, which were covered; the demand was so great that the water was never there long enough to get contaminated. As showing the necessity of this careful sterilization, I may mention that within 25 yards of the place from where our supply was pumped there was a wooden bridge, and during the course of its repair a human corpse was found in a high state of decomposition.

ENTERIC GROUP.

There have been many cases belonging to the enteric group, mostly paratyphoid A or B. However mild a disease paratyphoid may have been in the Mediterranean war area it was often very severe in the cases that came under our care. There did not appear to be any pathognomonic features and the variations in type were extreme. Cases with otherwise unexplained pyrexia lasting more than five days very commonly turned out to be of this nature. It was the milder ones that gave rise to the problems in diagnosis, and undoubtedly a large part of our difficulty was due to the fact that the patients were commonly not seen until the disease was either well established or the patient convalescent, but sent on to us for some complication. Some of the few cases which did develop under observation had rather severe abdominal pain, and in one instance I opened the abdomen under the impression that I was dealing with pelvic appendicitis. Fortunately the course of the disease was not influenced unfavourably.

Perforation is not common in paratyphoid, and in the numerous *post-mortem* examinations which I made it was quite unusual to find ulceration. I have seen specimens illustrating perforation, and know that one or two cases occurred, but during my stay in Mesopotamia, when we had a total of many hundreds of cases, I did not see a single case. I was several times asked to see patients in whom this complication was diagnosed, and on two occasions I opened the abdomen in the confident expectation that it would be found. In one of these there was infarction of the spleen, with haemorrhage into the peritoneal cavity, and in the other acute cholecystitis. Others of the patients died, and at the *post-mortem* examination I found perforation of the ascending colon, with liver abscess, the result of dysentery; acute paralytic distension of the stomach and intestinal tract; and cholera. In other cases the easy recovery of the patient showed the diagnosis to be wrong. So closely were the symptoms of perforation simulated in some of these cases that I should hesitate to accept any figures dealing with this complication unless supported by operative or *post-mortem* findings.

SCURVY.

Although scurvy among the British troops in Mesopotamia is only very rarely sufficiently obvious for the patient to be sent to hospital with a diagnosis, it nevertheless occurs, and has proved of much diagnostic interest and of importance in treatment. The cases can be arranged in three very definite groups:

1. Those in which scurvy is the explanation of some otherwise obscure haemorrhage.
2. Those in which it explains the sluggish healing of some wound or ulcer,

3. Those that occur in the course of some other illness for which the patient has been fed on sterilized foods for long periods.

The last class are etiologically akin to the scurvy rickets of infants (Barlow's disease); but the origin of the other cases is more difficult to explain. Whereas among the Indian troops whole regiments have been affected to the extent of from 30 to 50 per cent. of their effectives, only sporadic cases have occurred among the British, and it is perhaps only because of their exceptional interest that they have come before my notice. I myself believe that it is not entirely dietetic, and that lack in variety of food and monotony of surroundings have much to do with its causation. The actual symptoms of scurvy are often preceded by great bodily weakness and lethargy, conditions usually diagnosed as "debility," but which may be an earlier stage of the same nutritional condition that may later develop into scurvy.

The following case is a typical illustration of the first group:

A gunner, aged 26, was admitted to Amara with a diagnosis of haematoma of the thigh. He stated that he had usually been a perfectly healthy man, but that for the last four years he had had a delicate stomach, and had not touched anything sweet; for this reason he had always avoided sugar, fruit, and vegetables. He arrived in Mesopotamia in January, and had been up the line ever since. He kept in good health, and never had to report sick, though he said that for some time his gums had been tender, and sometimes bled when he cleaned them. About August 21st he started on a long march, and on the third day noticed some stiffness behind the left knee, but he went on and finished with the column, arriving at the destination on the tenth day. Two days later he had to report sick, and was sent into hospital on account of the swelling behind the right knee. At first it was only swollen, but after about four days the skin became discoloured.

On admission he looked quite a healthy man, though a little thin and sallow. The haemorrhage was very obvious as seen from behind; from the front the calf was noticed to be swollen, and there was discoloration up the inner side of the leg and thigh. Posteriorly the whole affected area was black and blue, the discoloration being darker at the extremities of the haemorrhage. The calf was indurated and slightly painful. He walked with a limp, and kept the knee a little flexed. There was no effusion into the joint. Scurvy suggested itself as the explanation, and on looking for other signs slight swelling and blood discoloration were found in the palm of the right hand and the lower part of the forearm. There were no petechial haemorrhages or other signs on the surface of the body, but the gums were quite typical. The teeth were very good, especially the incisors, but the gums around the latter were swollen and spongy, and on the apex of each pyramid between the individual teeth there was a bright red cap of submucous haemorrhage, like a bright red granulation, which bled easily. On the left side of the upper jaw there was a septic stump, and this was surrounded by especially well-marked swollen spongy gum. On September 14th the patient went to a concert and sat for a couple of hours. When he got up he felt a stiffness behind the right knee, and on September 16th he drew my attention to a patch of subcutaneous haemorrhage about the size of the palm of the hand on the inner side of the lower part of the right thigh and also a well-marked superficial haemorrhage in the popliteal space and upper part of the leg. He was put upon an ordinary diet with vegetables and a mixture containing citric and tartaric acids with syrup of orange and infusion of calumba. He improved rapidly, and by September 25th the haemorrhages were fading and the gums were nearly all right; by the end of the month he was sufficiently well to be transferred to a convalescent dépôt.

As examples of the second group I may quote the following case:

A man, aged 23, had been in Mesopotamia since the beginning of January and had been up the line all the time. He had kept quite well until the end of July when he developed what looked like trivial sores on the right foot, but as they made little progress he was sent down and admitted to a base general hospital on August 19th. Both these ulcers were typically indolent; the few granulations present were flattened and unhealthy looking, and there were no signs of healing at the edges; the discharge was thin and blood stained, and there was staining of the tissues around. The appearance suggested to me a scorbutic tendency, but the only confirmatory sign was the condition of the gums. The mouth was clean and sweet, and the teeth very good, but on the apex of the pyramids between each of the incisor teeth there was a tiny red haemorrhagic spot and a similar red line along the edges of the gum surrounding the molar teeth. Under appropriate antiscorbutic treatment the ulcers soon took on a healthier appearance, though their ultimate recovery was longer delayed than I had expected.

Examples of scurvy coming on in the later stages of some chronic disease like typhoid or dysentery were quite common, and several developed in hospital.

I was asked to see a man in the dysentery ward on account of an effusion into the knee-joint. I found the patient bright and cheerful but exceedingly emaciated. The right knee was flexed and contained a good deal of fluid. It was neither painful nor tender, there was no temperature and no haemorrhagic staining. I could not discover the cause, and thought that it might be an example of so-called dysenteric arthritis. The joint very soon improved and the man began to get about again, but two weeks later he suddenly developed a large subcutaneous haemorrhage down the inner side of the leg and extending into the instep and sole of the foot.

Another man recovering from a bad attack of enteric fever and who had been on milk diet for several weeks rapidly developed a large haematoma on the buttock, the tissues all round were also infiltrated with blood, and there were petechial spots on the legs. I drew off 30 c.cm. of broken-down blood clot, and a few days later a similar amount of haemorrhagic pus was evacuated by incision.

When well marked the characteristic appearances of the gums affect the whole mouth, but when only slight they may have to be looked for on the inner aspect and especially around some septic tooth or stump. The petechiae are nearly always confined to the lower limbs and the front of the chest, though they may be found elsewhere. The large haemorrhages occur either subcutaneously or into the muscles. The former are most common behind the knee or on the inner side of the leg and extending into the instep and sole of the foot, but they may be found in the palm of the hand and over the middle of the sternum. The deep haemorrhages are also commonest at the back of the knee, deep in the popliteal space, down the front of the leg, among the muscles on the dorsum of the foot, and on the back of the forearms.

In addition to these large intramuscular haemorrhages, there may be small haemorrhages among the muscles of the thigh or buttock. Quite often they are multiple and not infrequently suppuration takes place.

REFERENCE.

¹ Matthew D. O'Connell, *Lancet*, August 19th, 1916, p. 342. ² Turner, *Lancet*, May 26th, 1917.

ACUTE FEBRILE POLYNEURITIS.

BY

GORDON HOLMES, M.D., C.M.G.,

LIEUT.-COLONEL (TEMP.), R.A.M.C.,

CONSULTING NEUROLOGIST, BRITISH ARMIES IN FRANCE.

Most cases of polyneuritis which are met with in practice can easily be traced to intoxication by an organic or inorganic poison, or are complications of an infective illness, but the etiology of others is less certain or is unknown. Many of these have been called "rheumatic" or "influenzal" neuritis, or have been attributed simply to exposure to cold.

The cases with which we are concerned here are characterized by such a uniform and constant combination of symptoms that it is advisable to describe them as a type, though nothing is known of their actual cause. As their onset is usually acute and almost always associated with a rise of temperature, they may be provisionally included under Sir W. Osler's title, "acute febrile polyneuritis." Similar conditions have been described in other textbooks under this same title, or as "infectious polyneuritis."

Such cases have often been observed in irregular epidemic form, generally during the winter, but they also occur sporadically. Several came under my observation in London during one winter some years ago, and the course and the symptoms of those I have seen in France have been identical, or at least very similar, in all particulars. I have examined or have obtained notes on about twelve cases during the last winter. They have occurred among men from all parts of our front as well as from the lines of communication, and consequently they cannot be with any probability attributed to local conditions. The relatively small number that have come under observation suggests that there is no reason to suppose that the disease has been more common than it is in civil life, or that it is directly due to the conditions of life of our forces in France.

EARLY SYMPTOMS.

The onset of the illness is usually rapid. Almost all patients have stated that it began with a general malaise or with fever, at first without any definite local manifesta-

tions; several cases were in fact diagnosed at this stage as "pyrexia of unknown origin." One case developed a short time after an attack of relapsing trench fever, and another had had within the previous few weeks an attack of vomiting and diarrhoea. It has rarely been possible to ascertain the degree or the type of fever at the onset; in some patients the temperature did not exceed 100° F., but in others it rose to 102° to 103° F.

The next symptom was generally pains in the legs and in the lower part of the back, which usually set in on the second or third day and persisted. A day or so later, though occasionally even from the commencement, the patient found his legs weak or experienced difficulty in walking any distance. This paresis increased rapidly, and the arms became similarly but less severely affected. About the same time, too, the patient generally noticed that his face was "drawn" or "stiff," and several complained that even in this early stage their speech had become unnatural, or that they had some difficulty in swallowing.

SYMPTOMS OF THE ESTABLISHED DISEASE.

Most of the cases came under my observation when the disease was fully developed, and its clinical symptoms are then extremely characteristic. The lower limbs, which are equally affected, are flabby, toneless, and extensively paralysed, but the paralysis is rarely complete in all groups of muscles, and often all are in fact more or less uniformly affected. Neither now nor later is muscular atrophy a pronounced feature, and contractures did not develop in any case under my observation. The feet are dropped, the toes pointed, and occasionally no movement of either toes or ankles is possible. The movements at the knee-joints, and especially extension of the legs, are usually less severely affected, though they, too, may be paralysed in the severer cases. Even in these, however, the patient can with effort flex, extend, adduct, abduct, and rotate his thighs, though the movements are of small range and feeble.

The affection of the arms is usually less severe, and it is rare to find any movement completely paralysed, though the distal segments are usually very weak; as a rule, the feebleness is remarkably uniform throughout the limbs. The muscles of the trunk are much less seriously involved, though the intercostal and abdominal muscles are weaker than normal. In the two cases which died from pulmonary complications the paresis of the respiratory movements was probably a contributory factor to the fatal termination. I have not observed palsy of the diaphragm.

Thus far the motor disturbances correspond closely to that of any type of generalized peripheral neuritis, the only striking feature being the relative uniformity of the paresis and the fact that the distal muscles of the limbs may not be much more severely involved than the proximal groups. But when we examine the muscles innervated by the cranial nerves we find that certain of them are particularly severely involved. The face is invariably much affected from the early days of the illness; the facial folds disappear, the cheeks are flat and smooth, the forehead devoid of wrinkles, the lips slightly everted, and when the patient is asleep or dozing the eyes are incompletely covered by the lids. The face has consequently an expressionless appearance, which, if once seen, cannot be again mistaken. On further examination it is found that all groups of muscles supplied by the facial nerves are severely paralysed; the patient is unable to wrinkle his forehead, frown, close his eyes firmly, blow out his cheeks, or whistle. Articulation is slurred and indistinct owing to the palsy of the lips, fluids often dribble from the corners of his mouth if he attempts to drink, and he complains that during mastication the food frequently collects between his teeth and cheeks.

The tongue has not been affected in any case I have seen, nor is the palate often involved, though a few men complained of occasional regurgitation of fluids through the nose on drinking. On the other hand, almost all experienced more or less difficulty in swallowing solid food, and in one case this attained a severe degree. Phonation was unaffected, and there were no symptoms to suggest laryngeal palsy, though the larynx was not examined directly in any of the cases. The muscles of mastication were occasionally weak.