

STORIES FROM THE CAMPAIGNS OF NAPOLEON AND WELLINGTON

- **by** -

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During the first 70 years of the last century the art of the practical or pre-Listerian surgeon reached its zenith. I may mention a few names. Guthrie, who gained experience in the Peninsula war: Baron Larrey, the great surgeon of Napoleon's armies: Dupuytren, the great Paris surgeon: Astley Cooper, who first tied the abdominal aorta: Cheselden who cut 50 men for stone without a fatality: Syme and that master of his craft Fergusson. The great Morbid Anatomist Auvart, Cruveilhier Bright, Lebert, Hooper and Carswell, lived through the same period and each has left us volumes of beautiful illustrations of disease. How splendid were their labours, how much we are indebted to them. On the sure foundation laid by such patient pathological investigations the more perfect clinical diagnosis of the present day has been built up, and advances in surgery have in great measure been made possible.

This lecture is almost entirely composed of extracts from the writings of Larrey and Guthrie These two great surgeons laid down and practised the principles of the treatment of gunshot wounds which are in many phases of our work a sure guide to us at the present time. The examples, which I shall quote from their experience, will often bring to your minds similar cases, which we have had to treat in Malta.

Both men worked very hard and both were often in a very tight corner. When I first entered the profession the surgery of Larrey, Guthrie and other great practical surgeons held the field. The discoveries of Pasteur and Lister had not yet permeated the profession. Since that time I have lived through and been a witness of the wonderful changes and advances which scientific surgery has won over disease and injury in every part of the human body.

The Great French Surgeon: Baron Larrey

Baron Larrey was a prominent surgeon before Napoleon rose to power. In 1788, before the war with England, he visited Newfoundland as Surgeon in a French man-of-war. In order to reach his ship he walked from Paris to Brest. When at Newfoundland he made his first acquaintance with the English, of whom he wrote. "We were astonished at the beauty of the English women whom we met in the course of our walk, almost all were of good stature, well developed and with good figures, pretty hair, pleasant faces, bright eyes and surprisingly white teeth. In some chestnut hair and eyelashes contrasted agreeably with large blue eyes." On visiting an English man-of-war and witnessing a display of drill and gunnery, given in honour of the visitors, he wrote, "All these manoeuvres were remarkable for their precision and rapidity. I derived great pleasure from visiting this ship, where the most perfect order and the most scrupulous cleanliness prevailed. We sat down to table at noon with the officers and midnight found us still united." Nearly all the English officers spoke French well enough for us to follow the conversation. The captain had been with Cook in his last voyage around the world and related to us several of the adventures of this renowned traveller and the manner of his death".

The return journey to France commenced on September 27th and ended on October 31st. Bad weather was met with and there was a shortage of provisions and water. "There only remained a little brandy and one cow in calf, very thin". A Danish ship which was hailed with signals of distress made all haste to get away."

Larrey's advice for keeping the crew in health was good food, cleanliness of the ship, and exercise except during the hours actually devoted to sleep.

He issued instructions for restoring the apparently drowned.

"I have the patient, he wrote, laid on a mattress in front of a large fire. The clothes are removed and the body is rubbed unceasingly with warm flannel I pump in air with a bellows into one nostril while holding the other tightly closed: then I compress the chest and abdomen to drive it out. I put a little warm spirit into the mouth and stimulate the pharynx and nostrils with a feather impregnated with ammonia. I have an enema of warm decoction of tobacco given, and take care to have all aspects of the body turned in succession to the fire in order to avoid them equally and to avoid burns. Bleeding from the jugular is sometimes useful. Emetics and opening the trachea are useless. I continue the effort to resuscitate for about 6 hours". The use of the bellows reminds me that when I was a student I more than once witnessed the attempt to reduce an intusseption in an infant by means of the kitchen bellow, the nozzle of which was introduced into the rectum.

Larrey accompanied Napoleon on most of his campaigns including that of Egypt and the retreat from Moscow. The ship on which he had placed most of his stores for the Egyptian campaign was captured by the English on the way out. He observed on the ceilings and walls of Egyptian temples bas-reliefs of amputations performed with instruments very similar to those of his own day. He found also representations of other surgical operations and other surgical instruments in hieroglyphics, by which said he, "We see that in those ancient days surgery was as much advanced as the other arts, which seem to have been brought to a high degree of perfection."

Larrey advised and practised free incision for hepatic abscess, which he had probably read about in the writings of Jean Louis Petit, a famous French surgeon who died in 1770. He successfully treated some cases of gunshot wound of the intestines. He was, however, much troubled with various diseases and complications. Tetanus, ophthalmia and plague all required his attention. On one occasion 70 out of a garrison of 300 died of plague. He fully appreciated the danger of sepsis in hospitals as they then were, and when he could he sent his patients right away, however bad they were, the same day, after even severe operations, for he found that in spite of rough transport they did better, whether in the heat of Egypt, or the rigours of a Polish winter, when out on the road than when shut up in churches or hospitals. Larrey was so popular among the soldiers that on being recognised in the mass of struggling men on the bridge over the Berisina, he was handed on from soldier to soldier until he reached the other side.

Larrey met with several cases of external anthrax in Egypt, which he treated by removing the gangrenous pustule and applying liquid caustics to the wound. He was much struck by obtaining muscular contractions on stimulating the nerves of an amputated limb. "The results of these experiments" (he writes) led me to hope that electric stimuli applied to the nerves of paralysed limbs would recall them to activity and re-establish their functions."

When he went to the army in Spain he found the two chief surgeons much advanced in age and one of them nearly blind. He thought this was very wrong.

He gives a description of a mine explosion in his first campaign

“The enemy (Spaniards) blew up two of his redoubts which our soldiers had just entered. One can imagine no more frightful spectacle than this explosion. More than a hundred of our volunteers were within the fortifications when the mines were exploded; they were all blown up with the remains of the stone battlements and of the guns, which defended them. Regiments of the artillery, stones, men, or bits of their limbs were carried away pell-mell by the explosion and fell here and there from a more or less great height”.

After this explosion he had four cases in which he amputated two limbs: all recovered although much burned.

His departure for his next campaign having been postponed, he was detained at Toulon. He utilised the time by giving a course of instruction to the surgeons and students. “Every lecture on anatomy and physiology, he writes, was followed by illustrative experiments, and all the bodies from the naval and military hospitals were devoted to anatomical preparations and operative surgery.” During this time of waiting he also practised in Toulon and the surrounding country.

Larrey gives a description of Malta

“The whole island is very well cultivated, although the subsoil is hard limestone. It is mountainous, intersected by small valleys where the rainfall lodges and the water remains for a greater or less time and so adds to the fertility of the garden soil, which has been produced on the surface of the rock by labour and manure.

The island is covered by terraces of varied shape and size, arranged somewhat like an amphitheatre, and scattered about are very handsome country houses. The table-lands are so many gardens of orange trees, lemon trees, citron trees, fig trees and most of the fruit trees of Europe. The gardens are planted with the choicest and most beautiful flowers. A great part of the island is devoted to the cultivation of cotton, saffron, and a small quantity of corn and other grains. i.e. the cactus, grows wild and much advantage might be derived from this plant if the cochineal insect were attracted to it. The chief town of Malta is in the middle of the island and reaches up to the highest point, it is surrounded by impregnable ramparts and flanked by rows of towers bristling with cannon. The city of Valetta is well built and the roads to the harbour well kept up There are several fine palaces, beautiful churches, and a splendid hospital where we placed the few wounded that we had during the siege. The harbour is divided into several basins or canals, very deep, and large enough to take men-of-war, the height of the surrounding rocks shelters them from storms. Our fleet stayed there two days.

“The air of the island and of the town is good and pure, particularly when the wind comes from the west, which is the case for $\frac{3}{4}$ of the year, the west wind is cool and moist, it mitigates the burning heat of the day but the dampness renders it injurious at night: the humidity is so great that on remaining out of doors for one hour at night one gets as wet as if in a smart rain. The south winds blow during March, April and May with some intervals. These are ill winds and favour septic diseases, and during this season the invasion of plague is most to be feared. There is only one source of water

for the town and port, the water is good and very clear: cisterns to catch rainwater are hallowed out of the rock, this is used for domestic purposes and irrigation”.

Camel-broth

In Egypt on some occasions Larrey was in great straits for food for the wounded. On one occasion he could not get any meat to make soup for his patients so he asked General Retnier for camel-meat. The general gave orders that all camels unfit for service on account of wounds should be reserved for the use of the sick. The meat and the soup made from it were nutritious and quite palatable. But unfortunately this supply did not last long and we were soon obliged to replace camel-meat by horseflesh, which is much inferior”.

Plague State of one of the forts he had to deal with in Egypt

On the fort being taken he was sent to render it fit for occupation.

“I first sought for the sick and wounded which the enemy had left and found about 50 in the basements without light or fresh air, lying on heaps of putrid rags, without bed coverings and covered with vermin. These unfortunate had received no medical attention, nearly all had no dressing on their wounds, which were gangrenous and full of worms. Some had all the signs of malignant fever, one had a plague bubo in the right groin and another bubo on the leg. The courtyards were choked with human corpses and the bodies of dead animals, especially horses, already putrifying: the soldiers’ quarters were littered with rags and all sorts of infected and unsanitary objects.”

Hepatic abscess

Larrey had several recoveries, one with communication with pleura. He advised free incision. “The integument is incised in a suitable direction, the muscles and the aponeuroses are divided in the same direction and the abscess is incised to a proportionate extent at its lowest point, care being taken not to disturb the peritoneal adhesions, lest the pus escape into the peritoneal cavity or the intestines protrude. The opening can be extended as far upwards as necessary, or if the cavity is deep, a counter opening can be made”.

He relates a case of spontaneous recovery by the abscess bursting into the bowel, but says that such an unusual occurrence must not deter the surgeon from intervention.

He also wrote on Leprosy, Elephantiasis and Scurvy, which he observed in Egypt.

Venereal disease

There was a serious outbreak in the French Army in Egypt. “It was difficult enough to stop the effects of this contagion. In order to remedy this inconvenience and to stop the spread of syphilis I proposed to the General the establishment of a civil hospital for the reception of prostitutes affected with venereal disease, and also pregnant women of the same class, so as to prevent the abortion which they habitually induced and to preserve the lives of their children. A large house favourably situated was

obtained, where all women suspected of disease were taken, and those found infected were detained and treated with the greatest care. At the same time also a vigorous inspection was made in all the barracks and all infected soldiers were sent to the military hospital and there detained until cured. These measures proved efficacious.”

Un-united fracture

Larrey did not approve of the treatment proposed by some authors and carried out by several distinguished practitioners, which consisted in exposing the broken ends of the bone, resecting them, placing them in opposition and fixing the limb in an apparatus until union took place. A successful result, he says, is too rare, and he only knew of two instances: one by an English surgeon and one by a French surgeon. “When not able to obtain union the treatment should be abandoned to nature. The patients become accustomed to the deformity, the effects of which diminish with time and exercise.”

Clean dressings

He is very emphatic about this. He advised that “charpie should be made from new material, beaten and washed.”

Embalming bodies

He gives a description of the methods of preparing mummies and directions for preserving bodies. The method he advised was soaking the body in a strong solution of mercurial chloride and drying it by heat. “Two glass eyes are then introduced between the lids of the retracted globes, the hair is suitably dyed and body is painted all over with a lightly coloured varnish, which gives a life-like and fresh appearance to the skin. Thus may be preserved for thousands of years the remembrance and the features of heroes or great statesmen.

The defeat of the French at Aboukir

The signal for battle was given at 4.30am, our columns were set in motion and marched, calmly but with determination upon the English entrenchments. The intrepid bravery of our soldiers from the first moment promised victory, and our brave troops would no doubt have conquered had not a series of untoward events, which occurred during the battle and about which I can form no sure judgment, disturbed the order of the fight and arrested their impetus when they had already taken the first entrenchments.

General Roize was striking terror into even the most distant ranks of the enemy, when a cannon ball struck him dead in the midst of his soldiers. This misfortune compelled our troops to fall back and soon the whole army was in retreat.

A difficult retreat from Suez

“The fear of being murdered by the troops of the Grand Vizier compelled us after one day’s march in the deserts of Suez to leave the ordinary route and we entered a valley called the “Valley of the lost Way” into which we penetrated with a view of returning

to Cairo by the way of Upper Egypt. Not one of us had ever traversed these deserts of which we hoped every moment to see the end, but it was in vain. We marched for 2 ½ days over unknown paths, without finding any water to quench the thirst, which was tormenting us, and without seeing any trace of human beings. Our provisions were all consumed and we began to despair of ever reaching Cairo. 21 out of 100 persons of our party had already died of thirst, heat and fatigue, seven of these were French. Many animals died in the first few days, and we lost more at every step, at last when despair had maddened many of us, we saw an Arab in the distance coming towards us, and we hastened, purse in hand, to meet him and begged him to guide us to Cairo by any way by which we could quench our thirst, for we could no longer stand against it. After making known to us our error, and the country we had come through, he took the purse, stroked his beard, and promised to guide us to the capital. We marched on between fear and hope all the rest of that day. Exhausted by want and fatigue we had to stop every quarter of an hour. As night commenced our faithful guide came upon the spring which he had promised to find for us, and we all came to it to drink and fill our water bottles. We could now see Cairo in the distance and reached the city on the second day.”

Visit to the English Camp

After the capitulation of Cairo Larrey visited the English hospitals. “These ambulances were very well kept and provided with all necessary material, and practise seemed to me to be very successfully carried on there, but I was astonished to find that only three amputation cases recovered, although many amputations had been done. This proves again the superiority of French surgery over that of other nations, even the most highly civilised.”

Larrey was sent home to France on an English ship, the “Diana” and landed at Toulon.

Projected invasions of England from Boulogne

“I had taken all measures necessary to perfect all branches of my service with the Imperial Guard during the sea passage, and after a landing had been effected. The ships resounded with the acclamations of our soldiers who were burning with impatience to set foot on the enemy shore. It is difficult to express in words how formidable and imposing this force seemed: if we may judge from the movements of the English, they were already terror-struck and seemed unable to avoid the invasions which so sharply threatened them.”

“However, said these preparations, a new continental coalition was formed, France in her turn was threatened In this short interval the allied fleet proceeding to its station encountered that of Admiral Nelson and the terrible and memorable battle of Trafalgar took place. From that moment all was changed.”

Health of troops on the march

Snow and rain had constantly accompanied us on our march right up to Vienna, and the rapidity of the marches never allowed the soldiers to dry their clothes. They were deprived of comforts because the wagons were unable to keep up with us and there

was even no regular distribution of rations, except in the large towns. In spite of all these discomforts we had scarcely any sick. On the contrary, it seemed that when we entered Vienna, the health of the soldiers had become more robust. The adult soldier does not fall sick whatever fatigue he has to undergo in a cold climate, provided he is not subjected to long fasting, especially if he has at intervals a few hours rest. There is some risk in leaving him in complete idleness at bivouac when he has been marching all day exposed to rain or snow. Plunged in the profound sleep naturally induced by cold and fatigue, his vital forces are enfeebled and in a state of suspension, mucous secretions and cutaneous transpiration are diminished, internal absorption on the contrary takes place with the customary activity, the dampness of his clothes penetrates more easily, and thus arises disease, particularly rheumatism. It is fortunate for the soldier that on arriving at his station, though wet and hungry, he is obliged to seek and cut wood for his fire, and to find meat and vegetables for his soup and to prepare it himself. During this exercise he suffers no inconvenience from wet clothes, which soon dry at the bivouac fire. It is, then, necessary for the soldier to bivouac, not only in the interests of the inhabitants of the country but of the soldier himself especially when passing through a country so fertile as Germany, where the soldier has never wanted for bread, meat, vegetables, and beer, a drink much better for campaigning than a spirituous liquors, which the soldier generally abuses”

“The inhabitants of Germany, hospitable and humane as I found them, helped us in every way.” (Rather different now).

Tetanus

This disease seems to have given a great deal of trouble. Some cases of recovery are related. Larrey strongly recommends amputation for tetanus. He writes: - “the section of the limb made on the first onset of symptoms cuts off all communication from the source of the mischief with the rest of the body, this section discharges the vessels and puts an end to the dragging on nerves, and abolishes the muscular convulsion. These first effects are followed by a general collapse which favours the excretions, disposes to sleep and re-establishes equilibrium in all parts of the body. The sum of the momentary pains caused by the operation, cannot increase the existing irritation, and the pains of tetanus render those of the operation more bearable and diminish their intensity, particularly when the chief nerves of the limb at the time of the operation are strongly compressed.”

When amputation was not possible he recommended that the actual cautery should be applied to the wound. He must have realised that the source of the poison of tetanus was in the wound.

Nine days after an amputation at the shoulder joint, symptoms of tetanus occurred and in 3 days were fully developed: blistering ointment on the wound and large doses of opium had no effect. The actual cautery was applied to the wound. “The application was lively and extremely painful, but it was followed almost immediately by perfect quiet and profuse sweating.” The man recovered.

Larrey was without transport for his wounded on one occasion.

“Bonaparte ordered that all the horses of the general staff, not excepting his own, should be used for the transport of the wounded.”

Small-pox

“It is much to be regretted, “Larrey writes, “that while we were in Egypt we did not know of the important discovery of Jenner.”

Typhus

Larrey met with a severe endemic disease, probably typhus at Brunn. “The fever hospitals were soon overcrowded and the mortality proportionately great. At the same time the epidemic broke out among the Russian prisoners, whom we were obliged to house in great numbers in churches and other large buildings, lastly it spread to the populace, and extended along the whole line of communication, even in France.”

Aneurysm (non-traumatic)

This he attributed to syphilis, and says it does not occur in men who are engaged on laborious occupations if they lead a sober life ”and no vice circulates in their humours.” The syphilitic virus sets irritation at some point of the arterial inner coat. A sort of late inflammation is started the resilience of the arterial inner coats enfeebled, and as a result of the alteration of the texture the arterial wall yields before the blood pressure.” (Quite as good a description of syphilitic arteritis as could be found now.)

Amputations

Now that our art has, through 20 years of continual war, been brought to the highest possible point of perfection, we ought to have but one opinion on this subject.” Larrey regarded the question whether in gunshot injuries of the limbs amputation should be performed at once, or deferred, as the most important point in military surgery.

“While Faure tells us that after the battle of Fontenoy out of about 300 amputations only about 30 survived, we saved more than $\frac{3}{4}$ of our amputation cases although several lost two limbs. We attributed this success, first to a better appreciation of the indications for operation and the most favourable time for operating, second to more methodical dressings, and third to a more simple rapid and less painful method of operating.”

In amputations in military surgery he adopted the circular method and made little or no attempt to unite the wound: suppuration and separation of ligatures were regarded as normal and inevitable, in a few instances in which the ligature was retained he deliberately removed it.

Larrey recommended immediate operation when amputation was necessary. “The first 24 hours is the only time of calm reserved by nature and we must hasten to take advantage of it, as in all dangerous diseases, to administer the necessary remedies.”

He gives eight indications for amputation.

1. Limb torn off
2. Bones fractured with much damage to soft parts
3. Much loss of soft parts with damage to vessels even without injury to bone
4. Fracture with damage to muscles and chief nerves even without injury to artery
5. Fracture with injury to great vessels without external injury (After extent of injury has been verified by incision).
6. Fracture extending into ankle or knee joint
7. When a bullet or splinter of shell has passed through a limb and denuded a large surface of bone, even though the soft parts do not seem much injured.
8. When a large hinge joint, particularly the elbow or knee, has been opened. The indication is not so strong in ball and socket joints, such as the shoulder or wrist.

“After the Naval engagement of June 1794 a large number of immediate amputations were done: 60 of these were taken to the Naval Hospital at Brest, all recovered except two, who died of tetanus. But the surgeon of the *Temeraire*, which was taken by the English, put off operation, which was indicated in several cases, on the advice of the English surgeons, and had the mortification of seeing them all die on the voyage.”

In amputating at the hip joint he first tied the common femoral a precaution which Guthrie despised.

Among the multitude of cases which Larrey records I have time only to mention a few:-

Case of multiple wounds recovery

Seven very deep sabre wounds, two on the shoulders, divided the muscles and part of the scapula, one on the back divided the muscles and two of the dorsal spinal processes. This soldier also had a bullet wound in the chest with lodgement of the bullet and effusion of blood in the pleura, for which the “operation for Emphyema” was done. The man recovered.

Wound of external carotid

A general’s aide-de-camp was struck by a bullet, which divided the external carotid at its point of separation from the internal and where it passes into the parotid. The fall of the wounded man and considerable jet of blood, which spurted, from the two openings arrested the attention of two gunners. One of them, a very intelligent man, had the presence of mind to plug the wound with his fingers, and thus stopped the haemorrhage. I was sent for immediately and ran to give help in the midst of bullets and cannon balls. A compressive bandage methodically applied, to my great astonishment, arrested the rapid advance of death, and saved this officer. This is the first well authenticated example of cure for a similar wound.” (Would a compress permanently stop haemorrhage from a divided external carotid? It scarcely seems possible).

Wound of right frontal sinus

The bullet fractured the external wall of the sinus and split into two portions, one passed over the frontal bone, tearing up the skin for about a centimetre, the other lodged in the sinus and fractured the inner wall. The injury was followed by loss of consciousness and some slight symptoms of commotion.

The external fracture was of small extent and one could with difficulty believe that it had allowed the entry of half a bullet. The fragments were not displaced and I was obliged to trephine over sinus: by this means I discovered the foreign body and a fracture of the inner table. I extracted the lead easily with an elevator and applied a smaller trephine-crown to the inner table and perforated without difficulty the floor of the sinus. There was some blood extravasated between the bone and dura matter, which escaped. All symptoms subsided in a few days and the man made a good recovery.”

Bullet lodged in the Skull. Extra-dural abscess

The bullet after perforating the frontal bone near the sinus passed obliquely backwards between the bone and dura matter following the direction of the superior longitudinal sinus as far as the parieto-occipital suture, where it lodged. All the symptoms of compression were produced without any indication of the locality of the foreign body, the patient however always referred the pain to a point diametrically opposite the wound of entry, and the other signs left doubt of the presence of a ball inside the skull. I introduced a gum elastic catheter into the hole in the frontal bone and easily made it follow the track of the ball, which I recognised by its resistance and irregular surface. I measured on the outside of the skull the length of the track and made a counter opening with a large trephine, a quantity of pus escaped and I easily extracted the ball, which had depressed the dura and compressed the brain. There was no further obstacle to recovery.”

Epiglottis carried away by bullet

The bullet entered at the angle of the jaw, passed obliquely through the throat and emerged in the jugular region of the opposite side. The base of the tongue was grooved and the epiglottis carried away, the man spat it up after the injury and showed it to the surgeon who rendered first aid. He did not suffer much pain but his voice was scarcely audible. Whenever he tried to swallow he suffered from coughing and vomiting. Tormented by thirst, he made repeated attempts to swallow, always with the same result. “He had passed four days in this miserable condition when I saw him, luckily I had an oesophagus tube with me, through which I fed him.” The man recovered. “Speech and deglutition became in time perfect, doubtless the functions of the epiglottis were performed by the hypertrophied arytenoid cartilages and the extremity of the base of the tongue.”

Snow-blindness

English prisoners after or during the retreat to Corunna

“An English drummer-boy 12 or 13 years old, and his father, a corporal in the same regiment, were prisoners. The child, whom his father kept constantly on his knee, was completely blind. The blindness, according to the father’s account, came on suddenly while passing over the Asturias Mountains during the severe cold of the winter we had just passed through, this cold must have had all the more effect on him from his hair having been cropped and that, like nearly all the English prisoners, he had had to march barefoot all the way from Corunna to Valladolid. The grief of the father at the pitiable condition of his son was indescribable. Many of his comrades sincerely shared his grief, and I noticed with great satisfaction that all the prisoners were much attached to each other and showed a tender and generous mutual affection.”

The treatment was the application of a moxa at the angle of the jaw followed by the cauterization. Recovery of sight ensued.

“I procured a little Spanish cloak for this young prisoner so he might be more warmly clad, in the end I had the satisfaction of seeing father and son start for France quite cured.” (It is to be hoped that they reached England, our present foe would neither act nor speak so well).

Anomia: Loss of memory of names

An officer who had served through the Russian campaign had several times been wounded. He was again wounded with a fencing fork. The weapon entered in the left canine region near the ala nasi, and penetrated obliquely from below upwards and a little inwards. It doubtless passed through the cribriform plate and seemed to have reached the anterior end of the corpus callosum. On examination he was found to be suffering from right hemiplegia, amaurosis, loss of smell and taste. In a few days sight returned in the right eye, and after a month in the left Diplopia was, however, present. Smell was recovered in right nostril and taste on right side of tongue.

“Memory of nouns in any way related to proper names was totally abolished and was only imperfectly regained, while memory of images of anything that could be described was intact. He had forgotten the names of all his relations and friends. His expression was “I have him before my eyes, but I cannot remember his name”. He could not name any of the parts of a gun but could describe them all perfectly.

Larrey was obliged to leave a case of head injury in which he was particularly interested, so he left instructions that when the man died the head was to be cut off and put in a barrel with preservatives and sent on to France to him, which was done.

Effusion into the Pleura

Larrey does not seem to have had much experience in excision of ribs. He relates one case in which he tried to cut out a piece of rib so as to give more room. He seems somehow to have been very unsuccessful with the “operation for empyema.” How strange it is that one who could do 11 amputations at the shoulder joint in a morning (besides other work) should hesitate to cut out a bit of rib.

The Great English Surgeon G J Guthrie, F.R.S.

Guthrie was an historian of many military incidents, which occurred in the battles of the Peninsular War. He is also the historian of the surgery practised during the Campaign in the Peninsula. Guthrie relates, too, many cases he observed after the battles of Quatre Bras and Waterloo.

He wrote on amputations, diseases of the eye, gunshot wounds to the chest, head, abdomen, petoro, and limbs: and on many other surgical subjects.

In the preface to his book on gunshot wounds of the chest published in 1848 he makes some trenchant remarks on the medical administration of the army. (What a contrast with the British Army Medical administration in 1915 and 1916).

“When the army under the command of Sir Arthur Wellesley landed at Mondego Bay (Portugal) in August 1808 only two carts drawn by bullocks were loaded with stores for the Medical Department, and it was only when the army had attained the summit of the Pyrenees more than 5 years later, at the beginning of 1814, that the Medical Department could be said to be efficient. The last victory, that of Toulouse, was won on the 10th of April, 1814.

“The Hospitals of Toulouse were left in the highest order. The French and English surgeons visited each other. Every case of interest was thoroughly investigated, and the surgery of the British Army and of the French Empire dates much of its improvement from the facts elicited or confirmed on that occasion.”

“Within one year the battle of Waterloo took place. The army was not the Peninsular army, neither were all its doctors. Few, if any, of the Medical staff officers had seen a field of battle. I found the assistant surgeons doing everything they should not have done. The greatest efforts were made to obviate this state of things. Amateur surgeons flocked over from London. They rectified these events as far as they could but nothing could recall the past or the irretrievable mischief the insufficient medical care had occasioned in the first few days.”

“The same result has followed the four great battles lately fought in India (written in 1848) the same loss of life, the same succession of human sufferings, and the same loss to science. The surgeons were overwhelmed by the extent of their labours.”

“It does not signify by whom an army is commanded – the same evils will always follow if the same system is pursued. It may be the Duke of Marlborough or the Duke of Wellington, a Moore or a Lynedoch, a Beresford or a Hardinge. Their armies have suffered alike on this point: and their successors will also suffer, if the Civil Authorities of the Country will not allow themselves to be guided in matters medical, which they do not practically understand and a knowledge of which they have not acquired in a manner to render it thoroughly efficient.”

“At the battle of Inkermann a young officer, the son of a friend of mine, was wounded in the leg by a musket ball, which caused much loss of blood. A tourniquet was applied instead of the required operation being performed and he was sent on board a transport from Balaklava. The leg mortified as a matter of course and was amputated. He died an eternal disgrace to British surgery, or rather to the Navy which will not pay sufficiently able men – and therefore employs ignorant ones – the best they can get for the money.”

Guthrie had perhaps more of a scientific bent of mind than Larrey. He writes: -
“Surgery is never stationary, and surgeons of the present day must continue to show that Surgery is as much a Science as an Art.”

“I believe nothing in surgery until fairly tried and found to answer. Again, “A knowledge of the practice of physics is inseparable from the practice of surgery if the patient is to receive that assistance which the art and science of medicine in its most comprehensive sense can grant. The distinction between surgery and physics is artificial, one unknown to nature, foreign to her principles, and incapable of being preserved by those who have extensive opportunity of practising the profession.”

Guthrie lectured to medical officers of the army stationed on leave in London for 22 years, from 1815 onwards, without fee or any recognition by the War Office. He remarks: - “It is thought proper to employ a gentleman of high character to teach the veterinary surgeons how to cure the horses of the army, and surely something of the same kind should be done for the men.”

Guthrie was a great believer in the therapeutic value of bleeding and in giving a light diet to wounded men. As to bleeding who can doubt that it is still a valuable therapeutic agent and many of Guthrie’s cures strongly support this view. As to the question of feeding the wounded a letter to Guthrie from Lt. Col. Dumaresq dated July 2nd, 1815, throws light on this question from the point of view of the wounded man. Dumaresq was shot in the chest at Hougomont on the 18th of June. The last part of his letter is as follows:- N.B. Up to this period, the 2nd of July, the devil a bit have I eaten.

“Whilst with mutton chops and nice loins of veal
You stuff your damned guts, your hearts are all steel
Oh ye doctors and pothecaries, you’ll all go to hell
For cheating our poor troops of their daily meal.”

Guthrie was an opponent of the practice of flogging in the army and describes how useless this punishment was. He relates the case of a soldier named Needham

who from first to last received 15,000 lashes without their being the slightest use to him in the way of reformation. This soldier, he says, was a grenadier of the finest order of men, fellow of the kindest heart, an excellent soldier, but he could not resist rum. In America in summer or winter, for heat and cold were nothing to him, he would swim the harbour of Halifax on a stormy night and return to his post with as many bladders of rum tied round his neck as he could get money to buy. Of course everybody got drunk and Needham was flogged. He never disputed the justice of the sentence and admitted that he could not refrain from doing the same thing again. A brand is not affixed to a felon and Guthrie writes that it should not be to a soldier. Poor Needham died in the element he had so often braved with impunity. He was carried off the fore-castle of transport by a heavy sea in the Bay of Biscay and was long seen buffeting the waves in vain. No rescue was possible. Guthrie concludes this story with the words "Needham was the beau ideal of Grenadier."

How differently the soldier was cared for in the Peninsular to what he is now is seen in the following paragraph:-

War is an agreeable occupation, trade or professional employ for the few only, not for the many: and particularly not for the lame when they have the misfortune to have their limbs broken by musket. There are very few men in England who know what are the principles of medico-military movement with an army in the field, and it will not materially signify whether there should be even one so instructed. The nation at large shall be impressed with the idea that no expense, no trouble, ought to be spared to obtain for their soldiers so unhappily injured the utmost comfort and accommodation that can be procured for them, as well as the best surgical assistance. The first was little attended to in England during three-fourths of the Peninsular War, and the latter was supposed to be obtained, when the demand was urgent, giving a warrant to kill or cure to persons as dressers who were unable to undergo an examination with any prospect of success, and prove themselves worthy of a commission. Many a gallant fellow lost his life from the want of that proper care and attendance alluded to: many a desolate and unhappy mother mourned the loss of a son she need not have mourned for under happier circumstances, and who might have been the support and happiness of her declining years."

"Yet England calls herself the most humane, as well as the greatest nation upon earth: she claims to be the most civilized, and she may be so: but certainly in the care of those who have hitherto fallen in her defence, she could not on many occasions have been more careless or less compassionate."

Gunshot injuries of the head

When Guthrie published in 1841 in the opening paragraph of his well-known lectures on injuries of the head is true today not only of injuries of the brain but of abscess and tumour of the brain also.

He writes:-

“It may even be said that there is no one symptom which is presumed to demonstrate a particular lesion of the brain, which has been shown to have taken place in another of a different kind. Examination after death has often proved the existence of a most serious injury which had not been suspected: and death has not infrequently ensued immediately, or shortly after, the most marked alarming symptoms without any adequate cause for the event being discovered on dissection. Such are the deficiencies in our knowledge of the complicated functions of the brain, that although we can occasionally point out where the derangement of structure will be which has given rise to a particular symptom during life, the very next case may possibly show an apparently sound structure with the derangement of function.”

Despite the great advances made since Guthrie’s time it is that Guthrie’s honest words are still sometimes true. The most eminent neurologists may differ as to the localisation of a brain injury or disease. In the fable men differed as to the colour of the chameleon and all proved to be right, but in the localisation of a brain tumour injury, if observers differ only one can be right and all may be wrong, for there may be no brain injury or tumour revealed either at operation or autopsy.

Guthrie’s lectures on injuries of the head are full of interesting details. Here are some of his conclusions; -

1. A fracture of the vertex is far less serious than a fracture of the base.
2. Injury to the front of the brain is more dangerous than injury to the side of the brain, and much less so than injury to the posterior part of the brain. (This probably refers to the compound fracture, which follows fracture implicating the frontal sinus.)
3. In some cases part of the brain injured can be distinguished by symptoms produced.
4. In death from concussion Littre first demonstrated that there be no visible injury and this I have myself seen.
5. “Contrecoup injuries are rare, but they occur.”

Ambroise Pare (Oeuvres de Lyon) 1641, says:- “Henry the Second, King of France, received a severe blow on his body at the tournament of the field of the cloth of gold from lance which broke but did not unhorse him. A splinter was driven by the shock under the vizor, which it raised, and struck him over the right eyebrow, penetrating the eye itself but without fracturing any of the bones of the orbit. He died on the 11th day after the accident. On examination a quantity of blood was found extravasated between the dura and pia mater under the occipital bone directly opposite to the part struck by the splinter of the lance, and the brain underneath the extent of an inch was of a yellow colour and in a commencing state of putrefaction.” Contemporary writers affirm that the King did not fall from, but was lifted off, his horse and did not therefore receive any other injury than from the single stroke of the lance. (This reference to the field of the cloth of gold must be a mistake of Ambroise Pare or a mistake of translation (which hardly seems possible) of Guthrie, unless there was another field of the Cloth of Gold besides the one English children are taught about. The tournament at which Henry II, King of France, received his death blow was held in the Rue St. Antoine in Paris. The King was tilting to the Captain of the Scotch Bodyguard. The Captain’s lance broke. Under the rules the Captain should have at

once thrown away the part of the lance that remained in his hands, but he did not do this. The broken end of the portion of the lance held by the Captain raised the King's vizor and then struck the King's eyebrow.)

Dodging canon balls on horseback

“During the second attach on the hill which constituted the left of the British position at the battle of Talavera, by the French: I found myself under the fire of a battery of 12 guns and just at the distance at which the shot began to ricochet or bounce like cricket balls. The position was not desirable and I tried to change it as quickly as possible by carefully guiding my horse between the shot. Whilst doing this, a soldier of the 48th Regiment, whose corps was immediately in front, came running up to me and begged that I would look at his head, for one of the balls, he declared, pointing to one that was passing by, had just alighted on it: saying this he raised his cap and showed me portions of brain mixed with hair, the left parietal being very much shattered. I told him to walk to the field Hospital.”

2 Cases of Depressed Fracture

C Murray – Private 1st Foot Guards, aged 33, wounded at Waterloo on the 18th of June by a piece of shell. The left parietal was broken and there was paralysis of the right arm and leg. Operation on June 20th. Many depressed bone fragments removed. Complete recovery.

Mr Mitchell of the Royals, aged 40, wounded by a musket ball at Waterloo. The vertex was injured, both parietal bones were fractured and depressed on either side of the sagittal suture. Symptoms: great pain, sickness, paralysis of both legs. June 28th, Operation on both sides of the sagittal suture. Recovery. Many cases of injury to the middle meningeal artery were observed by Guthrie.

“A French Artillery driver at the battle of Vimiera was struck on the side of the head by a musket ball near the anterior inferior angle of the right parietal bone. The case being reported to me I found him early the next morning unconscious in a village. I let out clotted blood from under the bone. The middle meningeal artery was torn across. This patient died but many similar cases recovered.”

“The inner table of the skull is often driven into the brain and operation should be done on the first day so as to avoid cerebral hernia and irritation. In fact all cases with depressed fracture of the skull should be operated on at once.”

Guthrie recognised the difference between depression of the skull in the child and in the adult. In the former, he says, the skull is not brittle. He adds:- “Heliodorus, who followed Celsus but preceded Galen, had much more proper ideas than many of his successors of a much later age. Heliodorus recommended a simple incision for exposure of the skull or two incisions in the form of a cross. (By far the best plan in cases of infected gunshot fracture of the skull).

Another case

W.A. a private wounded two days before Waterloo by a musket ball. The left parietal bone was fractured. The soldier was unconscious at first but on recovering consciousness could not speak. June 19th bullet and broken fragments of parietal bone removed. Sent to Brussels.

Patient recovered.

Guthrie compares this case with one treated by Larrey. The inner table was driven into the anterior lobe and there was much suppuration. I regret, says Larrey, I did not operate at once "Occasion principis judicium difficile."

Another Case

Thomas O'Brien, wounded at Quatre Bras, June 16th, by a ball fracturing the skull in the occipital region. There was much comminution of bone. June 28th, large crucial incision abscess and bullet in occipital lobe. Operation, says Guthrie, was too late to save life.

Guthrie relates how a severe blow on the skull may cause pulping of the brain beneath without fracture of the skull: and, he adds, if the dura does not pulsate it must be incised.

Guthrie relates a case which, I think, he saw with Larrey at Cairo. As both Larrey and Guthrie describe this case they probably assisted each other at the operation. Larrey's description has already been given. "A soldier was wounded by a musket ball in the middle of the forehead. It passed presumably between the bone and dura as far as the occipital suture. Symptoms of compression came on. A gum elastic bougie was passed along the track to determine where to apply the trephine. A large trephine was applied. The bullet and abscess were evacuated and the soldier recovered.

Guthrie says of hernia cerebri that after a time it is withdrawn within the skull, that it is due to a low form of inflammation of the brain and that its removal is erroneous, but, he says, Lambert of Marseilles relates a case of fungus cerebri, portions of which he cut off daily, but the treatment was interrupted as the patient in a fit of drunkenness tore off the remainder.

Guthrie was quite right about the pathology of hernia cerebri and the danger of cutting away such a granuloma. It has been done in all good faith in this war, but the surgeon had not read Guthrie.

Guthrie writes:- "One of the improvements in modern surgery is to be found in the restriction which has gradually been placed on the repeated use of the trephine on the same person, and on the removal by this means of large portions of the skull. Saviard in 1702 trephined one person 20 times. Two surgeons of the King of Navarre removed both parietal bones from a patient by repeated trephining. He lived for 30 years afterwards. Solingen says that Phillips of Navarre having been thrown from his horse, fractured his skull in several places by striking his head against the stump of a tree and that his surgeon trephined him 27 times. Philip gave a certificate of this and Solingen adds "As a proof of his complete recovery he afterwards drank 3 of his companions to death."

Large portions of the skull are nowadays sometimes removed in order to extirpate tumours or for the purposes of decompression, but the operation is completed at one time, the many sittings referred to by Guthrie are a thing of the past.

The Treatment of wounded Arteries

Guthrie laid down the great principles to be adopted in the treatment of wounded arteries. He writes:- “The great principles of surgery to be observed in cases of wounded arteries, and which ought never to be absent from the mind of the surgeon are 3 in number:-

1. In primary haemorrhage no operation ought to be performed if the bleeding has ceased.
2. In secondary haemorrhage the operation must be done even if the bleeding has ceased, because it will surely recur.
3. That no operation is to be done for a wounded artery but at the spot injured unless such operation not only appears to be, but is, impracticable.

Illustrative Case

Sergeant Wm. Lillie of the 62nd Regiment, aged 32 years was wounded in the right thigh on April 10th, 1814 at the battle of Toulouse by a musket ball, which passed through in an oblique direction downwards and inwards close to the bone, describing a track of seven inches. The ball was extruded behind on the field. He said he had bled a good deal on the receipt of the injury, which he had stopped by binding a band round the limb. The discharge from the wound was considerable; it appeared, however, to be going on well until the 20th of the month, when, on making a sudden turn in bed, dark coloured blood flowed from both orifices of the wound in considerable quantity. Guthrie says: - “I had given an order, as the Deputy Inspector General in charge of all the wounded, that no operation should be performed on a wounded artery without a report being sent to me and an hour at least, being granted for a reply, unless the case was of too urgent a nature to admit of it. It appeared to be so in this instance, and before I arrived Mr Deare had performed the operation for aneurysm at the lower part of the upper 3rd of the thigh. I could only express my regret that it had been done and point out the probability of the occurrence of the haemorrhage from the lower end of the artery. This took place on May 7th, when the limb was amputated and the man subsequently died.

Guthrie adds:-

“French surgeons have related several cases of the successful treatment of cases of haemorrhage from the main arteries which have occurred in gunshot fractures in the present war by exposure and ligature of the injured spot in the artery.”

Gunshot wounds of the Chest

Guthrie on wounds and injuries of the chest is replete with interest He advocated free opening of the chest in cases of haemothorax. I think in Malta we have lost cases by not acting on this principle more frequently. Many of his chest cases recovered. In one

case he removed pieces of cloth and spicules of bone from the lung, operating successfully through adhesions. In another successful case of 2 lb shot passed through the chest so that light could be seen from front to back.

Wounds with bayonets and lances are very uncommon – says Guthrie. “Regiments advancing with the bayonet seldom meet their foes: discretion becomes the better part of the valour: one party walks silently and angrily away.”

“A piquet of Portuguese infantry being surprised by a sudden rush of French cavalry from the town during the first unsuccessful siege of Badajos were nearly all sabred. Those who survived were brought to me. Two, who had been run through one side of the chest, were losing blood from their mouths and wounds. The wounds were closed by stitches and compresses and brandy and water given. Both cases did well.

Musket balls do not always penetrate

A soldier at Talavera crept up to me white as a sheet. On opening his coat I found a musket ball had struck the sternum. This ball had made a rounded indentation in the skin. A few days later in the retreat from Truxille I saw him. He gave me a piece of hog in gratitude, which I accepted as I was very hungry.

“Lieut. Tylden Patterson was struck, in the Pyrenees, by a ball in the left breast. I found the ball had been stopped by a copy of “Gil Blas” which was in the lieutenant’s pocket. When struck he sprang 3 feet in the air and fell breathless and apparently dying. Many days elapsed before he recovered. It should be noted, says Guthrie, that a severe non-penetrating blow may lead to inflammation of the pleura and lung.”

I saw a somewhat similar case with the late Sir Prescott Hewitt after the battle of Tel-El-Kebir. A colonel of the Artillery rode up to an Egyptian and told him to throw his musket away. Instead of doing so he fired point blank at the officer. The bullet smashed the left elbow and a large watch, which was in a pocket over the heart and then stopped without perforating, but only bruising the skin. The bridle arm dropped and the colonel fell from his horse as if dead. Recovery from the blow over the heart occurred in a few hours.

General Sir Lowry Cole was struck by a musket ball at Salamanca on July 22nd, 1812. The ball entered below the left clavicle breaking the first rib and came out through the scapula. He spat blood for 3 days. The pulse in the left arm was much smaller than in the right and fears were felt that haemorrhage from the subclavian artery would occur. Several fragments of the scapula and a large piece of the 1st rib came away, but 3 months after the injury he resumed command of the 4th Division. The arteries of the left arm always beat less forcibly than those on the right. He died from rupture of an abdominal aneurysm in 1844. (A quite similar case was nursed in Malta last summer).

General Sir Andrew Barnard was wounded at the passage of the Nivella on November 10th 1813 by a musket ball, which penetrated between the right 2nd and 3rd ribs. He suffered much loss of blood from the mouth, great difficulty in breathing. Pieces of bone and cloth came away from the wound and in eight weeks the General resumed his command.

Lt. Col. Harcourt and Major Jellies of the 40th Regiment were both shot through the chest at the assault of Badajos. They were taken to the same tent. Inflammatory symptoms ran high in both. "In Major Jellies, a tough old Scotchman, they could not be subdued, but Col. Harcourt slowly recovered.

Resection of Rib

The operation for empyema, writes Guthrie is of right ancient and military origin. "Phalereus Jason and Prometheus being expected to die of abscess in the lungs, declared to be incurable, went into battle for the purpose of getting killed, but each being fortunately only run through the body, they all recovered in consequence of the escape of the purulent matter through the holes thus made."

Hippocrates certainly operated for empyema but Ambroise Pare seems to have been the first to use the trocar and cannula. Guthrie writes much on this subject and strongly urges that, as soon as much fluid accumulates in the chest a free opening should be made low down in the wall of the chest so as to completely evacuate it.

A non-commissioned officer of the cavalry was wounded at the battle of Albuera on the 16th July, 1811 in the left chest by a lance. He became insensible from loss of blood from the wound and from the mouth. Some days afterwards he was brought to Guthrie with great difficulty in breathing, so that he was obliged to be raised nearly to an upright position. The wound had closed: the chest was full of blood. I operated and removed a large quantity of blood purulent matter. In 3 weeks time he was convalescent.

Guthrie also relates cases of bullets lodged in the mediastinum and gunshot injuries of the heart and pericardium.

Gunshot wounds of the Abdomen

In Guthrie's lectures on Gunshot Injuries and Wounds of the Abdomen the details of 112 cases are given. He describes very fully the history of the operation of suture of the intestine, but omits to mention that Celsus, 50 years B.C. sutured perforations of the intestines, cut away gangrenous omentum and sutured the abdominal wall in layers. Guthrie says "That the idea of sewing together and thereby restoring the continuity of the bowel is attributed to 4 surgeons of Paris, who having united their efforts for the relief of the sick poor in that city in the 13th century, procured a portion of the trachea of an animal, one end of which they introduced into the upper end of the divided bowel and the remaining piece into the lower end. They then brought the divided ends into contact and retained them by as many stitches as appeared to be necessary."

Guthrie described cases of musket balls traversing the abdomen. In some of these blood was vomited and passed per rectum and yet they recovered, and many of us have seen such cases. In cases of prolapse of omentum and intestine Guthrie cut of the omentum and when necessary sutured the intestine. He could not operate on abdominal wounds so successfully as my colleague Cuthbert Wallace has done in France, as he died before the era of anaesthesia and antisepsis. In abdominal injuries he says the chief cause of death is haemorrhage. Pelvic injuries he looked on as very

serious. Cases of gunshot wounds of the liver he had known to recover. General Sir John Elley was wounded at Waterloo in the last charge of the heavy cavalry by the point of a sabre below the eusform cartilage. The stomach was wounded but the patient did well.

Guthrie relates the case of an insane lady who opened her abdomen with a pair of scissors and then cut away 17 inches of small intestine. She recovered. Injuries of the spleen are usually fatal from haemorrhage but a prolapsed spleen, he says, may be cut off and the patient may recover.

Cases are related, too, of haemorrhage from solid viscera and rupture of hollow viscera from non-penetrating blows and Guthrie contrasts these cases with a rupture of small intestine by a kick of a horse over the pubes with no bruising of the abdominal wall. Guthrie relates with approval a case of Baron Larrey's in which the abdomen of a soldier was grazed by a musket shot. Larrey opened the abdomen and removed much blood. The patient was much better for the operation but died a few days later.

At the Evacuation of Gallipoli I operated on 2 cases of gunshot wound of the abdomen shortly after the wounds had been received. In the first case the liver had been injured and there was much haemorrhage but the soldier did well for three days, when he died suddenly: of secondary haemorrhage, I suspect. In the second case the blood came from a very severely torn mesentery of the small intestine. There was too great intra-mesenteric extravasation and the case was hopeless.

Guthrie relates the case of a private of the 43rd Regiment who was accidentally injured by a ramrod entering below the navel and penetrating the 2nd lumbar vertebra. Much force was required to extract it. The man recovered.

Guthrie was very much interested in a case of gunshot wound of a private at the battle of Sabraon, February 10th, 1846. The man died in England, and so came under Guthrie's care. At the post mortem an opening was found in the diaphragm and the stomach transverse colon and omentum had herniated into the left chest.

Gunshot wounds of Knee Joint

Guthrie writes: - "Wounds of the knee joint from musket balls with fracture of the bones composite it require immediate amputation. Many cases of wound in the knee joint in which the capsular ligament has been wounded and the articulation opened into without injury to the bones, do well, such as simple incised wounds made with a clean cutting instrument. The success attending all wounds of the knee joint, depends entirely upon absolute rest, upon the antiphlogistic mode of treatment being rapidly enforced, on the healthy state of the atmosphere and on the locality being free from endemic disease, but wounds of the knee joint, however simple, should always be considered as of a very dangerous nature, infinitely more so than those of the shoulder, the elbow, or the ankle.

When a poultice to a gunshot wound of this kind is applied I consider it the precursor of amputation.

Gunshot wounds of Joints other than the Knee

The following operations are recommended mainly with the view of getting good drainage and in order to avoid amputation: -

Gunshot wound of elbow – excision of joint

Gunshot wound of upper arm with injury to upper part of humerus – Removal of head of humerus.

Gunshot wound of upper part of femur with involvement of the hip joint – removal of head of femur.

In his lectures in London he said about removing the head of the femur in gunshot fractures involving the hip joint:- “I have not done this operation on the living man but you must do it and I am sure you will succeed in saving life in the end.”

Amputations

Guthrie writes:- “The removal of a limb should not occupy two minutes, but the securing of the blood vessels should be done without reference to time: when carefully effected there is little fear of secondary bleeding, and the stump should be closed at once.”

Guthrie was strongly against the practice of amputation for almost any injury to a limb. He says:- “A wound of the femoral accompanied by fracture of the femur, however, requires amputation.” We have saved some such cases in Malta but have also lost them by too conservative treatment.

In very foul and sloughing wounds Guthrie recommended the application of Sulphuric acid 1 in 12. This reminds me of the use of Ricord’s paste when I was a dresser – it was used for rapidly extending venereal gangrenous ulceration.

Compound Fracture of Humerus

“Receive it as a general rule that whatever may require to be done in the first few days had better be done on the first than on the second. A free vent for matter is always of the greatest importance. If the bone is greatly shattered an incision sufficiently large and deep to enable the surgeon to remove the splinters will be necessary. Add to this a wound of the brachial artery on which you must place two ligatures, one above the wound and the other below it. You will now perhaps be able to put your fingers through the arm and the wound will look ugly. Nevertheless the arm must not come off. It is only 60 seconds or so between an arm off and an arm on, but as a man is not a crab he must run great risks to keep his arm.”

Conclusions.

1. An upper extremity should not be amputated for almost any accident, which can happen to it by musket ball, and there is scarcely any injury of the soft parts, which would authorise amputation as a primary operation.

2. If the head of the humerus is shattered it should be removed. The patient will have a good arm. I disagree with Baron Larrey and the French surgeons who say that injuries of the upper third of the arm bone require amputation.
3. If the elbow joint is shot through excise it if you know your anatomy.
4. A forearm should not be amputated except for special reasons and a report must be sent to the Inspector General. Arteries should always be secured at the site of bleeding.
5. Serious injury to the wrist joint generally requires amputation.

Time at which Amputation should be done.

“Although Military Surgeons have agreed in general as to the necessity of the operation in particular cases yet they have disagreed very much, and still disagree, as to the precise time when it should be performed, some recommending it to be done as soon as possible after the receipt of the injury, others again deferring it until a period of from 3 to 6 weeks when the first inflammatory symptoms should have abated.

Wisemen, surgeon to Charles II, who served in the Army during the war of the rebellion and also in the Navy against the French, says in the 5th edition of his work published in 1719 “In the heat of fight, whether on land or sea, the surgeon ought to consider at the first dressing what probability there is of preserving the wounded member and accordingly, if there are no hopes of saving it, to make his amputation at that instant, whilst the patient is free from fever. Amongst us abroad it was counted a great shame to the Chirurgeon if that operation was left to be done the next day, when the symptoms were upon the patient and he spent with watchings.”

“Le Dran, consultant surgeon to the French Army, wrote in 1740 “That when an amputation was indispensably necessary in the case of gunshot wound, it ought to be done without delay.”

Ranby, surgeon to King George II in his campaigns in Flanders confirmed the opinion and practice of Wiseman (1760). “The neglecting of this critical juncture of taking off a limb frequently reduces the patient to so low a state and subjects his blood and juices to such an alteration as must unavoidably render the subsequent operation, if not entirely unsuccessful, at least exceedingly dubious.”

“Bilguer, who was in 1762 Surgeon General to the Prussian Army, published a treatise against amputation in general. In consequence of this opinion he suffered no amputations to be performed in the Prussian Army. Bilguer, says Guthrie, was not a good authority but his influence was wide and affected the practice of surgery.”

M. Faure, a French surgeon, won the Surgical prize of the French Academy of Surgery in 1762, determining in favour of delaying the operation of amputation in all cases in which it was practicable to do so.

Baron Larrey, who like Guthrie, had great practical experience, was in favour of immediate amputation.

He was Inspector General of the Hospitals of the French Army, and during his campaigns, and in his writings he endeavoured to prove that the great advantage of immediate amputation and to establish its superiority over that usually practised at a subsequent period. He was thus a powerful supporter of the views of Guthrie.

“Mr John Hunter, Inspector General of the Hospitals of the British Army in 1794 and indisputably the first surgeon of the age in which he lived, was against amputation in the field of battle – except that a patient after amputation can be moved with more ease without a limb than with a shattered one. Guthrie writes: - “Mr Hunter, whose great talents would have left nothing to be written on gunshot wounds, if he had had the same opportunities of acquiring knowledge on this subject as he had of others, has erred on a point that could only be decided by personal experience.”

Guthrie on the time at which amputations should be done with illustrative cases.

“If at the end of 6 hours after the injury the soldier has recovered from the general constitutional alarm occasioned, his pulse regular and good, his stomach easy – he is less agitated, his countenance revives and he begins to feel pain and stiffness, he will now undergo the operation with the greatest advantage.” “He will recover in 9 cases out of 10 in any amputation on the upper extremity or below the middle of the thigh without any bad consequences.”

“If, on the contrary, the operation be performed before the constitution has recovered itself he will die, for the additional injury will be most probably more than he can bear.”

Operations done too soon.

At the storming of Ciudad Rodrigo I amputated a thigh in a convent close to the breach within an hour of the accident at the anxious desire of the patient – the leg having been destroyed by the explosion of a shell. At daylight the next day I found him dead.

Operation done at the right time

At the battle of Salamanca two men were brought to me about 4pm, one with his arm carried away at the shoulder and the other with the leg and knee smashed. They were very low. They were laid in a ditch, a little rum and water given to them during the night. At five the next morning they were much recovered and both were successfully operated on.

Guthrie’s final conclusions

“The objections to immediate amputation on the whole I consider to have arisen from theory, not practice, and they may therefore be disregarded. It is an error to consider that such cases cannot always be removed from the field. “I removed an

officer during the first siege of Badajos 4 hours after amputation at the shoulder joint a distance of 13 miles.”

“At the last siege of Badajos and that of Ciudad Rodrigo all capital operations were done on the field and afterwards sent to hospitals 3 to 5 leagues distant. No bad consequences occurred.”

“Secondary haemorrhage seldom occurs after primary amputation. Most cases dying of primary amputations die during the first 24 hours. In secondary amputation the state of health and other issues, such as dysentery, militate against recovery.” Guthrie allowed patients after serious operations a little brandy and water.

As in Malta in our experience, so in the Peninsular, some of the most promising of surgical cases died of other diseases, such as fever or dysentery.

The method of dressing amputation wounds

Guthrie writes: - “All that is necessary is to keep the edges forward. Baron Larrey agrees. To close the stump will cause much mischief and even death itself. If there is fever, whatever else you do, separate the flaps and dress the wound from the bottom.”

