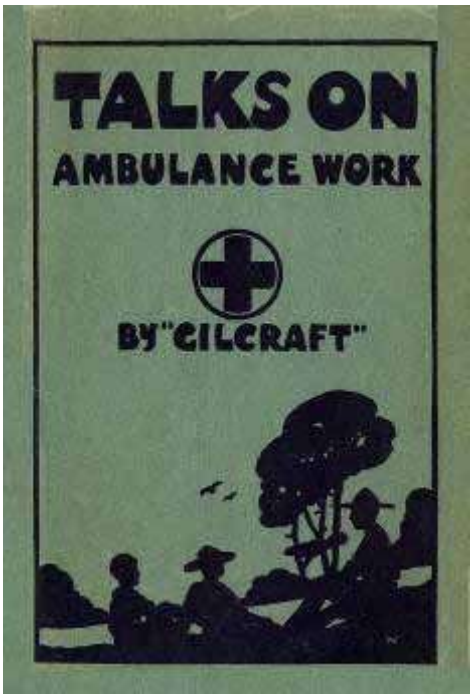


TALKS ON AMBULANCE WORK

BY

"GILGRAFT"

(W. L. Stephen M.B.,CH.B.,D.P.H.)

WITH 50 DIAGRAMS

London
C. Arthur Pearson Ltd.
Henrietta Street

First Published *1926*
Second Edition *1930*
Third Edition *1933*

Printed in Great Britain at
The Mayflower Press, Plymouth. William Brendon & Son, Ltd.

Editor's Note:

The reader is reminded that these texts have been written a long time ago. Consequently, they may use some terms or express sentiments which were current at the time, regardless of what we may think of them at the beginning of the 21st century. For reasons of historical accuracy they have been preserved in their original form.

If you find them offensive, we ask you to please delete this file from your system.

This and other traditional Scouting texts may be downloaded from The Dump.

FOREWORD

IN studying this book, as indeed in studying any Scout text-book, I advise the Scouts and Guides to keep in their minds the higher ideals that it leads to.

If you take the book literally as it stands it teaches you all about First Aid, and how to render aid in different cases of accidents; but if you read between the lines it is the means of teaching you in a practical way the two points of your religion –

1. To reverence God.

2. To help your neighbour.

In learning about First Aid you have necessarily to learn a good deal about anatomy, and the more you study anatomy the greater becomes your admiration of the wonderful machinery of the human body, and the deeper grows your reverence for Him who created it.

Then, in learning how to apply First Aid to the injured, remember you are not doing this for your own amusement, nor merely for the purpose of winning a badge to wear, but in order that you may be able at any time to give help to a fellow-creature – you are doing it for love of your neighbour.

So, while you are learning First Aid from this delightfully interesting book, I hope you will keep these two higher points before you as an incitement to you to put forward your best effort, and at all times to "Be Prepared."

(Signed) BADEN-POWELL OF GILWELL.

CONTENTS

PREFACE

THIS book was written at the suggestion of Mr. J. S. Wilson, Camp Chief, Gillwell Park, and I wish to acknowledge here my indebtedness to him for his always helpful advice and criticism. There are several excellent books on First Aid, but those are written for adults, and contain more detailed and technical information than is necessary or even desirable for the Boy Scout. Our aim in teaching First Aid to Scouts should be, above all, practical. We want to turn out a Scout who, when an accident occurs, will know what to do and how to do it; who will not lose his head, or faint; one also who knows his limitations, and will not rush in rashly and perhaps do more harm than good in cases which are outside the scope of any but a doctor or a trained Red Cross man. Keeping this aim before me, I have tried in these talks to be practical in describing the treatment for various emergencies, and to draw attention to those cases where it is better to wait for the doctor than to attempt treatment. Technical terms are almost entirely omitted, and I suggest that squeamishness can best be overcome by occasionally staging a "faked" accident, with plenty of blood and mud, so as to accustom the boys to such things.

If this book is used for teaching purposes, as is intended, instructors may find it desirable to split up some of the chapters. In any case, do not give too much at one time. Ten to fifteen minutes of lecturing is quite enough, and the remainder of the time should be used for practical work such as bandaging. In all practices insist on strict discipline. The Patrol-leader or Second should take charge, examine the patient, and decide what is to be done. The other Scouts should wait quietly until he gives his orders. In this way unnecessary fuss and confusion is avoided. Never forget the message to the doctor if that is necessary. It should be clear and concise.

All through your training let your motto be Common Sense.

For the sketches illustrating the test I am indebted to W. G. Montgomery, Esq., O.B.E., D. Potter, Esq., J. Fenton Wyness, Esq., F.S.A. (Scot.), to whom I wish to express my grateful thanks.

CHAPTER I

THE HUMAN MACHINE

TEACHERS of First Aid for Scouts are handicapped by the fact that most books written on Ambulance are for adults, and contain too many details. The extent of the Boy Scout's training should be: (1) How to deal with common and minor accidents of everyday life, and (2) How to deal with those injuries where delay in treatment involves further danger or pain to the sufferer; anything beyond these is outside the scope of the Boy Scout. Within these limits the training should be thorough and very practical, and should not have as its goal the passing of the 1st or 2nd Class or Ambulance Badges, but the turning out of a Scout who can really be of use when accidents occur.

In the following series, technical terms are almost entirely omitted and only essential details given, and the attempt is made to explain not only how to act, but why.

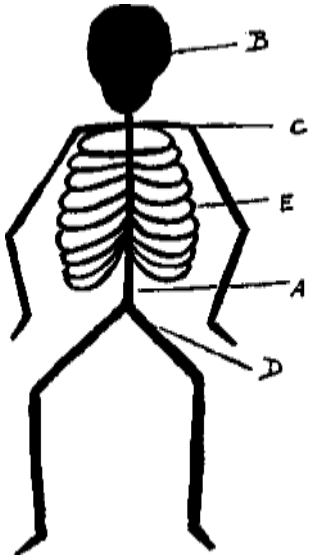
While each system will be dealt with in more detail, before describing the injuries to which it is liable, it is well to begin with a general talk on the structure of the body.

The human body is a machine, a very efficient one too – so one may compare it with another machine – the motor-cycle – and note the points of similarity and difference. The motor-cycle has a frame to support all the other parts and to give rigidity. The body has its counterpart in the skeleton, a number of bones (the exact number is of no importance) joined together, and on these the other parts are built. Had we no bones we would flop on the floor like a mass of jelly.

Diagrammatically the skeleton may be depicted in a few lines so:

A. The spine or backbone.
B. The skull.
C. The shoulders and arms.
D. The hip bones and legs.
E. The ribs.

The engine of a cycle makes the machine move, and the muscles of the body act in the same way. The muscles are the fleshy parts – the beef which you sec in the butcher's shop – and they are fixed to the bones; but we will talk about how they work later on.



The Frame.

A motor-cycle needs fuel – petrol – to keep the engine running, and the fuel of the body is the food we eat and drink. But just as petrol needs to be vaporised in the carburettor before it will explode in the cylinder, so our food has to be altered before it can be used to supply energy to the muscles. This process begins in the mouth and is continued in the stomach and bowels. Eventually, in the form of blood, it reaches and feeds the muscles and all other parts of the body.

In the cycle the fuel reaches the engine partly by the suction of the pistons and partly by gravity, but in the body the fuel (i.e. blood) is driven by a pump – the heart – contained inside the rib cavity. The blood runs from the heart through pipes, but it differs from petrol, for after it has been used in the body it goes back again to be recharged with energy and to be purified. This takes place partly in the lungs, which are two big air bags, one on each side of and contained in the rib cavity.

Oil is very important in a motor-cycle, and every moving part must be kept lubricated. If this is neglected, much friction occurs and results in overheating of the metal parts. The body also has many joints, all of which are supplied with a fluid which acts as a lubricant and ensures smooth working.

Now, to make the comparison complete we must put a rider on the cycle. He sees the road, hears the sound of the traffic, and then controls the movement of the cycle. In the body the brain is the rider. It gets its messages from the eyes, the ears, the nose, the skin, and then directs the body as to how it shall go, and what it shall do. The brain is contained in the skull, and its cables and wires run to all parts of the body.

You will notice that no mention has been made of the skin, which is the most obvious part of the body. Well, the motor-cycle has not got a skin, and does not want one. As you all know, a motor-engine wants to get rid of the heat caused by the using up of its fuel; but here the body differs, for it wants to keep the heat caused by the action of the muscles, and so the whole body is covered by a thick substance – the skin – which only allows heat to escape when the body is getting too warm.

So to recapitulate – we have the skeleton keeping the body upright, surrounded by the fleshy muscles, and covered by the skin. Fuel formed from the food is pumped along by the heart and purified in the lungs – the whole governed by the brain.

A rather wonderful machine, is it not? – a machine which not only feeds itself, but which never stops year after year until completely worn out; a machine which mostly does its own repairs while still running, and which can even, within limits, replace parts which get lost or destroyed. Were it not very efficient, it would break down much more often than it does, for no other machine is so badly used – overworked, neglected, and uncared for – by its owner as our own human machine – our body.

CHAPTER II

PUNCTURES

IN our first talk it was suggested that Scouts must learn how to deal with the common injuries of everyday life. Of these, cuts and scratches are probably in the majority. Not very serious, you will say, and most often healing up quickly, yet every now and then one reads in the papers of a death caused by a scratch.

How does a tiny opening in the skin lead to the stoppage of the whole machine, and why does it only happen sometimes?

The answer is, that any opening in the skin may allow the entry into the body of germs which can poison and cause its death. A dart from a blow-pipe makes a tiny wound, but it is quite sufficient to give entrance to the poison on its tip and to cause death.

Germs are very tiny living bodies, so small that thousands of them, end to end, would be needed to make a line half an inch long, so small that they can only be seen through a powerful microscope. These germs are to be found everywhere – in the dust of the air, in the soil, in water, on your hands and clothes – in fact, universally. There are many different kinds, every disease has its own special variety, and fortunately very many are harmless to man, even if they do get inside.

When dangerous germs find an entry, a big battle begins, for the body has forces which it calls up in an emergency. You will hear more of them later on, but meanwhile it is enough to know that the body has these soldiers to do battle for it. If they are strong enough they kill and throw out the invading germs quickly; but if they are beaten the germs spread all through the body and cause long illness, or perhaps death.

Let us compare the body to a strong castle in the Middle Ages with many enemies surrounding it. So long as the foes can be kept outside the walls the garrison is safe, but when a breach is made the danger becomes great; the bigger the breach the greater the danger. The captain sends his men to guard the breaches, and when the enemy rush to the attack the garrison fight hard to keep them from forcing their way inside.

The issue depends on two things: (1) The numbers of the enemy, and (2) The strength and resisting power of the garrison.

Let us suppose the garrison are successful and kill or drive off all those who gained entry. What does the captain do? It will take time to build up the breach in the wall, and so long as it is open it is a source of danger, so at once he sends a party outside to rush up a temporary wall of stakes, earth, etc., while others begin the slower task of rebuilding the damaged wall.

Now keep this parable well in mind and you will not find it difficult to understand the methods of treating cuts and scratches.

When the skin is broken, germs are almost sure to be carried into the wound. They may have been lying on the skin, on the blade of the knife or axe, or they may be clinging to a piece of clothing, and with it get driven into the body. We cannot tell if they are dangerous or harmless, but we can be sure that they are up to no good, so we must first drive out or kill as many of them as possible.

A little bleeding from a wound is probably good, as it washes out many germs. We can do the same by washing the cut with water, e.g. holding it under a tap.

This will not kill the germs, and for that purpose we must add "antiseptics" to the water. There are very many kinds of these, but we won't mention many here. A good antiseptic can be made by dropping a few crystals of PERMANGANATE OF POTASSIUM into a bowl of water until it forms a purple solution. Carbolic acid, in various forms, is another common one. Get to know one or two, learn the proper strength for their use, and stick to them. A very good antiseptic is TINCTURE OF IODINE (the weak solution). This is painted directly over the wound and surrounding parts with a brush or piece of wool.

We have now cleared out the enemy from the breach, and must keep him out until the skin has had time to heal. This we do by placing over the wound a *dressing.*

Dressings are made up in various forms. Lint is one of the commonest and most useful. It is of two kinds – plain white lint, and pink or boracic lint, so called because it is lint impregnated with boracic acid, a weak antiseptic. Look at a piece of either kind and you will

see that one side is plain and one side woolly. The former should be placed next the wound, as the woolly side tends to stick. Lint may be put on the wound wet or dry.

Other dressings are various kinds of gauze, usually made up into convenient little packets. All these dressings, before the packet is opened, are free from germs, and so can be put directly on the wound.

As we noted earlier in this talk, however, germs are found nearly everywhere, and your hands are probably covered with them. Even if you have just washed, the towel with which you have dried has probably got germs on it. (Ubiquitous little beggars, aren't they!) Before handling wounds or dressings, then, wash your hands thoroughly, using some antiseptic if you have got it. Don't dry them and don't touch anything else, unless you are quite sure it is clean, until you have put on the dressing and covered up the wound. This sounds very finical, but if you will just remember that germs are lying everywhere you will see the importance of it.

Often you have not got proper clean dressings and have to use old bits of linen, etc. However clean these may be "socially," they are full of germs "surgically." These can all be killed by boiling the dressings for ten or fifteen minutes, so when you are in doubt about the cleanness of your dressing, put it in a pan and boil it. In handling the dressing, even if your hands are clean, hold it by the corners so that nothing comes in contact with the part which is to lie next the wound.

An emergency dressing, when nothing else can be had, is a piece of white paper – *not* newspaper or anything with writing on it – which is first scorched before the fire.

On top of the dressing put some cotton-wool (this should never be put next the wound, as it sticks badly), and keep the whole in place by a bandage; but of these we shall talk later.

This has been a long talk, but it is an important one. The treatment applies to wounds great and small. In camp, all cuts and scratches should be reported; cuts cleaned in some of the ways described above, and small scratches and abrasions painted with iodine. The latter need hardly any protection, as a film from the body soon closes them up and prevents further trouble.

CHAPTER III

"RUNNING REPAIRS"

BURNS are very common, especially in camp, but they vary greatly in degree – from the slight reddening of the skin caused by a mild sunburning, to severe burns where skin and flesh are charred and destroyed. The latter are very serious indeed, and quite frequently cause death. When this occurs it is commonly due to what is known as SHOCK, and some degree of shock is present in most burning accidents, except the most trivial ones.

Shock is a condition which is easily recognised, and as it is found not only in burns, but in many other painful injuries, we may describe it now. The sufferer looks pale, and his skin is cold and clammy. You may often notice little beads of sweat on his forehead, and if he speaks, his voice is very weak, while his pulse can barely be felt. As we said above, this condition is a serious one and must be treated at once, sometimes even before dressing the burn.

The patient is cold, so the obvious treatment is to try to warm him. Wrap him up in warm blankets, put hot bottles to his feet and round him, and give him hot coffee, tea, cocoa, or soup to drink. Be quite sure that he is conscious, however, before trying to give him anything to drink. An unconscious person cannot swallow, and any fluid put into the mouth may run into the lungs instead of into the stomach.

It is a golden rule that you must never, in any circumstances, pour fluid into the mouth of an unconscious person.

Another warning has to be given about the use of hot bottles, bags, or bricks. Their heat must always be tested (not by the palm of the hand, where the skin is thick, but by the arm or the face), and if too hot they must be covered by a piece of flannel, or the like, and carefully placed so that they are not against the bare skin of the patient. He may be unconscious at the time and feel nothing, but he won't bless you when he wakes up to find, in addition to his other injuries, a painful burn due to your carelessness.

We seem to have got away from burns, so let us get back. Burns may be caused by dry or wet heat. In the latter case a burn is termed a scald. This is of purely theoretical interest for the Scout: the treatment is the same for both.

The pain of a burn is increased by exposure to air, so what we must do is to cover up the burn as quickly as possible. Remove the clothing from the burned part, *being careful not to break any blisters.* If the clothing stick to the burned skin, do not drag on it, but cut off the surrounding parts and soak the part still adhering in a solution of 2 teaspoonfuls of baking soda to a pint of tepid water (water just at body temperature). It may come off easily then – if not, leave it there. If it *is* possible, place the burned limb in a bath of warm water (at body temperature, 98.4° F.), and leave there while you prepare the dressings. Plain white lint, or gauze, or clean linen should be cut into strips, soaked in the solution of baking soda (two teaspoonfuls to a pint), and laid on so as to cover the whole wound. Cover with a piece of oiled silk, cotton wool, and a bandage. The reason for applying the lint in strips is because it makes future dressing easier.

If you have not got baking soda, lint, or gauze, cover the burn with a thick pad of cotton wool, or several clean handkerchiefs, and bandage lightly.

Oils of various kinds, butter, flour, and so on, although comforting, should not be applied, as they make the wound messy, and interfere with subsequent cleaning and dressing.

Where a whole Patrol is available to help, one or two might be preparing the dressings while others are removing the clothes. Some would treat shock while others went for a doctor or arranged a stretcher, etc.

Most of you have worked in a chemical laboratory when at school, and you know that you can get very severe burns from the strong acids and alkalies there. If burning is caused by an acid, wash the burn with water so as to dilute the acid, and then bathe with a solution of baking soda in warm water, and treat as for an ordinary burn. If by an alkali, dilute as above with water, then bathe with a solution of equal parts of vinegar and water, or other WEAK acid solution. Don't try to neutralise a strong acid by an equally strong alkali, or vice versa. Then treat as for an ordinary burn.

A burn from an electric wire, or from friction by sliding down the gym rope too rapidly, is also treated like the others.

You may have to treat cases of sunburn. This is not often serious, but can cause much discomfort. The best treatment is prevention. Don't on the first day in camp expose your arms, face, and neck, or any other part of your anatomy, to strong sunlight for hours on end. You won't get a nice brown, but red, like a boiled lobster, and probably won't sleep at night from the discomfort. If you *have* done this, then smear some carron oil over the parts affected and keep them covered for a day or two. This is one of the few occasions when a Scout may excusably be seen with his sleeves rolled down!

Stings of Insects and Plants. It is not necessary to tell you that some insects can sting; but you may not all know that there are certain plants which, when you touch them, produce the same effect. In some people stings of either kind cause considerable shock, and if that occurs it must of course be dealt with at once, as described above.

Mop the part freely with weak ammonia, or with a solution of washing soda. Remove the sting, if possible, if it is still there. Paint with iodine.

Frostbite. This does not often occur in our country. It is caused by exposure to severe cold, and the parts affected become first white and then bluish, while all feeling is lost. The circulation must be restored by vigorous rubbing with snow or cold water, and until this is done, as shown by change in colour and return of feeling, the sufferer must be kept away from a fire or a very warm room.

Grit in the Eye. How miserable a minute particle of grit in such a sensitive place as the eye can make one, and how great the relief when it is removed!

Turning up the upper lid.

When you have to deal with it, set your patient on a chair or a log in a good light. Stand in front and get him to move his eye slowly from side to side, and up and down. If you cannot see any speck, gently pull down the lower eyelid and look in, paying special attention to the corners. It may be necessary to look under the upper lid, and this, with a little practice, is not difficult, nor should it be at all painful. Place a match ½ in. above and parallel to the edge of the lid, and press gently backwards. With the other hand take hold of the eyelash and pull gently towards you, and then upwards. The lid will turn over on the match and expose its under surface, and can be held in this position with one hand.

The speck, when found, is removed by a camel's-hair brush or the corner of a handkerchief. If, however, it is embedded in the eyeball, do not try to remove it. Run a drop of castor or olive oil into the eye, put on lightly a pad of wool, and take the patient to a doctor.

If the eye has been burned with quick-lime, brush off any lime hanging to the lashes and bathe the eye with vinegar and water. Then put in oil and proceed as in the last case.

CHAPTER IV

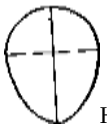
THE CIRCULATION OF THE BLOOD

ALL the different parts of the body are nourished by fluids and oxygen carried by the blood. In addition, the blood removes the waste materials.

Blood consists of a clear yellowish liquid in which float enormous numbers of small round bodies called corpuscles. These are of two kinds: *(a)* Red corpuscles which carry the oxygen, and *(b)* white corpuscles. The latter act as scavengers and help to kill any germs which have gained entrance. They are in much smaller numbers than the red, the proportion being about 1 to 500. These corpuscles float in the clear liquid – they are not dissolved in it.

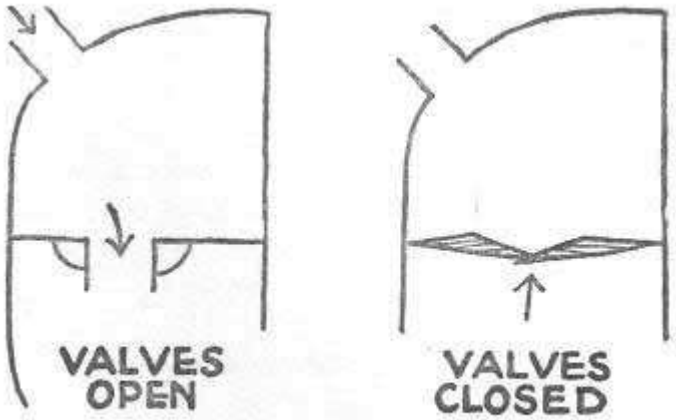
As the heading of this article suggests, the blood circulates round and round the body in a continuous stream, the motive power being the heart. The heart lies in the chest between the two lungs, but mostly on the left side, and is like an elastic bag, with strong walls made of muscle. The muscle contracts or tightens about seventy-two times every minute, and each time it does so blood

is spurted out. Clasp your hands together so as to leave a hollow in the middle, put them partly into a basin of water, and alternately squeeze and relax. You will find that each time you squeeze, water spurts out; and as you relax, it rushes in again to fill the hollow. That is exactly how the heart works.


Heart

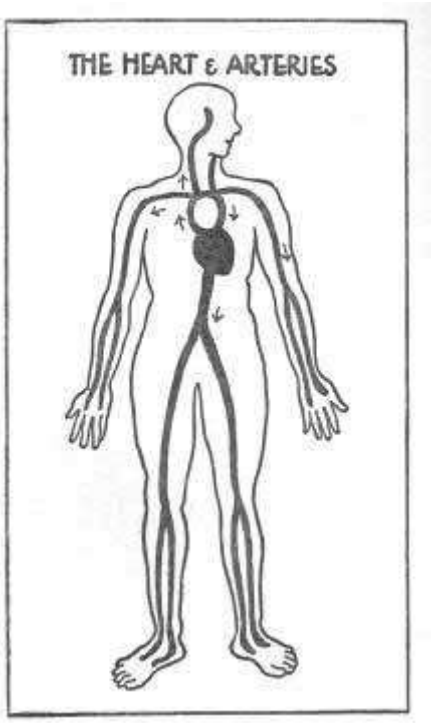
The heart is divided into two halves by a vertical partition in the centre, and each half is again divided by horizontal partitions, so that we have four chambers.

The horizontal divisions have each an opening, through which the blood can flow, but only in one direction, for these openings have got small movable flaps or valves which prevent the blood from flowing backwards. Look at the sketches below and you will see how they work. When the heart is expanding, blood flows into the two top chambers and through the openings into the lower parts. Then, when the heart starts to contract, the pressure of the blood closes the valves so that nothing can pass back. Two other openings allow the blood to flow, not back into the upper chambers, but out into the body. These are also guarded by valves which work in the same way, but close and open alternately with the valves in the middle partition, so that when the heart is expanding and filling with blood ready for its next pump they are closed, and the blood already driven out cannot return until it has circulated to the body.

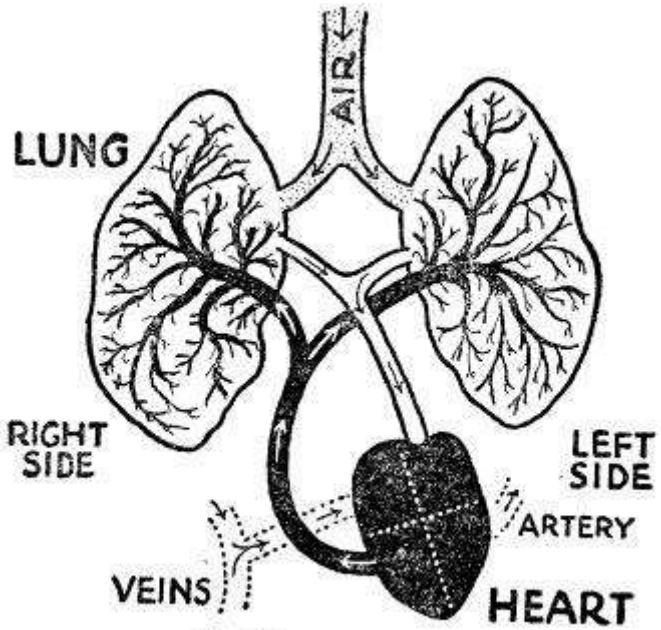


The valves of the heart.

Let us trace the blood after it leaves the left side of the heart. It is pumped out into a big pipe called an ARTERY. You will see from the sketch below how it goes up to the neck, curves round, and turns downward behind the heart, coming gradually to the centre of the body, Here it splits, and one half goes down each leg. As it goes it gives off branches to the head, the arms, and the various organs. Each of these branches again divides and subdivides like the twigs of a tree, until every part of the body has a tiny artery supplying it.



When these tiny branches become very small they are called CAPILLARIES, whose walls are so thin that the oxygen and fluids contained in the blood can pass through and so reach the various tissues to feed them. At the same time the waste materials in the body pass into the capillaries and are carried away. The blood, which on leaving the heart was pure and bright red, now contains impurities, e.g. CO_2 in place of O_2, and has lost its brightness of colour, being now of a dark red.



Circulation of the blood.

One capillary now joins another till gradually they form bigger vessels, and these are called VEINS. The veins run back through the body, usually alongside the arteries, joining one another and gradually getting bigger as they approach the heart, and finally all the impure blood pours into two big veins which empty together into the right upper chamber of the heart. Thence it flows into the right lower chamber, and when the heart contracts is pumped out into a big pipe which carries it to the lungs. In the lungs the blood vessels branch again until they form a great network of tiny vessels with very thin walls. The lungs consist of big elastic sponges into which air is sucked each time we breathe, and so the blood is now surrounded by air. It gives up its CO_2 and gets O_2 in exchange, and then, purified, returns to the upper *left* chamber of the heart, down to the lower left chamber, and so out to the body again.

Each time the heart beats you can feel a corresponding throb in any of the arteries. This is called the pulse, and occurs about seventy-two times in a minute. After vigorous exercise it is much faster, but, in health, soon slows down on resting. As the blood stream passes through the many small capillaries it loses this throb, and in the veins no pulse can be felt at all, but the blood just moves along in a steady flow.

If an artery is cut you will notice that the blood flows out in spurts and is bright red. From a vein the flow is steady and the blood much darker in colour. This point is important in the treatment of bleeding.

CHAPTER V

BLEEDING

WHEN a blood vessel is cut, the blood, of course, pours out. When blood escapes from the body and comes into contact with the air a change occurs. All the corpuscles lump together and form a *clot,* while the fluid part can be seen as a clear yellowish liquid. If the vessel cut is a small one, this clot sticks in the hole and plugs it, and so prevents further loss of blood until Nature has time to mend the cut. This is what happens in scratches and tiny wounds. Where, however, a bigger vessel is cut we must help Nature. There are various methods which we can use, according as the flow is much or little. Remember that a little loss of blood from a cut is not at all serious, so don't get alarmed whenever you see a little blood.

HOW TO STOP BLEEDING

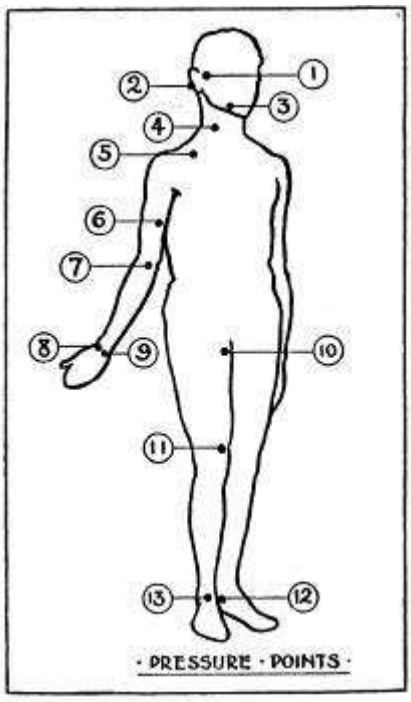
(1) Bathe the cut in cold or *very* hot water. This helps to stop the flow.

(2) Apply pressure directly on the cut by means of a *clean* pad of lint or other dressing and bandage up tightly. If the wound is in a limb, raise it above the level of the heart.

(3) If that does not succeed you must apply pressure to the vessel some distance away from the wound. If the bleeding is from an artery, this pressure must be applied above the wound, i.e. nearer the heart; if from a vein, beyond the wound. There are various places where the vessels can easily be pressed against the bone behind them. This diagram shows you the most important ones, and you must practice finding them until you are sure you can get them at once. You know you are on the right spot when you can feel the pulse beat under your finger. *(Finger,* note – not *thumb;* you have a pulse of your own in the thumb, which may mislead you.)

No. 1. To stop bleeding from a wound on the top or front or side of the head. Press ½ in. in front of the opening of ear.

No. 2. For back of head. Press 1 in. behind centre of ear.



No. 3. For face (except forehead, No. 1). Press about 1 in. in front of angle of jaw.

No. 4. For neck. Press backward against the spine at side of neck about half-way up.

No. 5. For the shoulder. Press down and back behind the middle of the collar-bone. A padded key handle is useful here to relieve fingers.

No. 6. For the arm. Grip biceps (the big muscle in front of the upper arm) with four fingers from above and twist towards you, or grip below and twist till you feel the artery pulsing against the bone. The seam of the coat is the line of the artery.


Pressure at elbow.

No. 7. For the forearm. Place a pad in the elbow and bend the arm. Fix with a figure of 8 bandage.

Nos. 8 and 9. For the hand. Press ½ in. inside each side of wrist in front.

No. 10. For upper leg. Press in line of seam of trousers.

No. 11. For lower leg. Put pad behind knee, bend leg, and fix as for elbow.

No. 12. For foot. Press behind inner ankle bone, forward and outward.

No. 13. Press on centre of front of ankle.

(4) You cannot keep up pressure long with the fingers, and perhaps you find it does not slow the loss of blood. Then use a tourniquet. This is a mechanical form of applying pressure. On the pressure point place a firm pad, a stone or piece of wood wrapped in a handkerchief will do, and round it put a loose bandage. Push a stick under the bandage and twist it so as to tighten up the bandage until the bleeding stops. You can then fix the stick with another bandage, but remember that a tourniquet must never be left on too long. If the doctor has not arrived within about twenty

minutes, untwist the stick a little and you may find the bleeding has stopped. If not, allow the blood to flow for a few seconds and then tighten up again. If there is no bleeding do not remove the tourniquet, but leave it quite loose, so that it may be tightened up quickly if necessary.

In all your work remember the necessity of cleanliness; *but* if a big artery is cut, the all-important matter is to stop the loss of blood in the quickest possible way.

When bleeding occurs from the nose, keep the patient sitting up with the head back. Place a sponge or cloth wrung out of cold water at the back of the neck, and another at the root of the nose. If that fails, very gently plug the nostrils with cotton-wool.

Bleeding from the ear is often the sign of a fractured skull. Wipe away the blood, but don't try to plug the ear; keep the patient quiet until the doctor comes.

Internal Bleeding. When you are fighting with another boy it is quite possible you may get, or give, a smack in the eye. The result very soon is "a black eye." This is the simplest form of internal bleeding. A small vessel has been ruptured, and the blood, which cannot escape through the skin, spreads round in the loose parts underneath. This injury is called a bruise, and results in a "black and blue" appearance. If you can apply pressure immediately the blow is struck, by means of a pad of some kind, and keep it up for ten or fifteen minutes, you may stop the blood from escaping from the blood vessel, and then there will be no bruise. Once a bruise has formed, the best treatment is to apply cloths wrung out of cold water and renew frequently. A piece of wet lint, covered with a larger piece of oiled silk, and then with a layer of cotton-wool, will keep damp for some hours.

Sometimes bleeding occurs so deep in the body that it does not come to the surface and nothing can be seen. Because of the loss of blood the patient becomes weak and breathless and may fall. The pulse at the wrists can hardly be felt, and the face becomes very pale. Lay him down and keep him as quiet as possible. Give him cold water to sip, or, if you can get it, ice to suck. Don't give him anything warm, and especially no stimulants, such as whisky. If he has pain, apply cold-water dressings to the place.

When bleeding occurs in the stomach it will probably be vomited, and can be recognised because it is mixed with food.

If from the lungs, the blood will be frothy. In both cases treat as described above.

In all cases of severe bleeding send for a doctor at once, explaining in your message what has occurred.

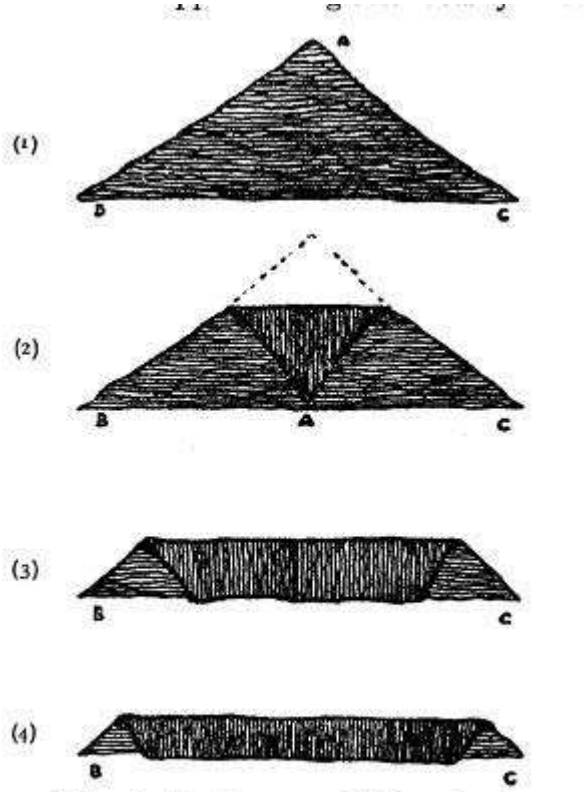
CHAPTER VI

BANDAGES

You must be quite clear as to the use of bandages. They must be distinguished from *dressings,* such as lint or gauze or boiled linen. *Dressings* are germ-free materials which are applied to any open wound or cut. *Bandages* are used to keep these dressings in place, and should never be applied directly over any cut or grazed surface. Where the skin has not been broken, e.g. in a bruise or sprain, bandages may be applied direct without any dressing beneath them. Be particularly careful never to use any coloured material such as a Scout neckerchief as a dressing for a cut or graze, as the dye will probably poison the wound. Other uses are to fix splints in place, to sling an injured arm, etc.

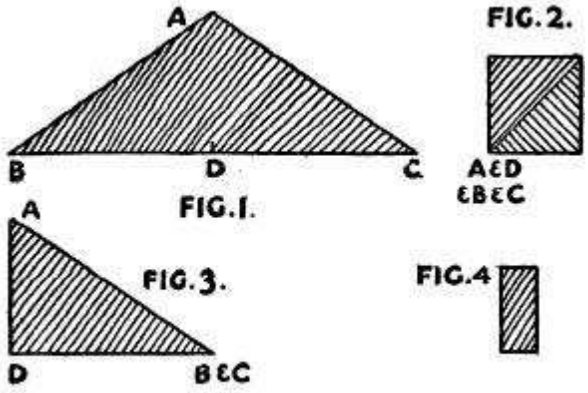
The most common bandage used in First Aid work is the Triangular bandage. It is made of linen or calico in the shape of a right-angled triangle, the long side of which is 40 in. in

length. To understand the descriptions of the methods of application given later you had better study this first diagram. The long side B – C is known as the *base*, while A is the *point.* B and C are known as the *ends.*



1. Triangular bandage. 2. Folding a bandage.
3. Broad-fold bandage. 4. Narrow-fold bandage.

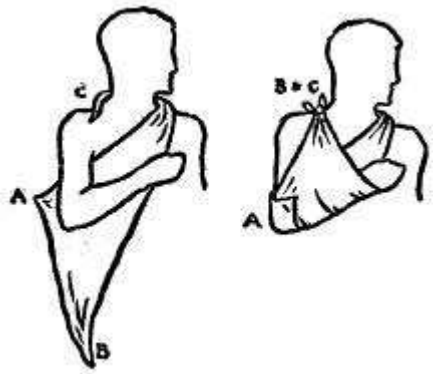
If you are making bandages for Troop use – and this is the most economical way of doing – get all the edges neatly hemmed. When the bandages are not in use they should be kept folded, and should be washed and ironed occasionally. It is impossible to bandage neatly with a creased and dirty bandage.



Folding a bandage for packing away.

Sometimes the bandage is used open, e.g. as a broad arm sling. At other times it is convenient to use it folded, either as a broad-fold or a narrow-fold bandage.

To fold, lay it flat on a table. Bring the point A to the centre of B – C. Fold over lengthways again in the same way to make a broad-fold bandage, and again to make a narrow-fold. To fold for packing away, proceed as shown above). Bring B and C together. Then bring B – C and A, to D, to form a square. Fold once lengthways.



Large arm sling.

The large Arm Sling. This is one of the commonest uses for a bandage. To apply, lay one end of the bandage over the shoulder on the uninjured side. Bring the end behind the neck to hang down over the other shoulder. Place the point of the bandage under the elbow on the injured side and gently place the arm across the chest in front of the bandage, in such a position that the hand is higher up than the elbow. Take the lower end of the bandage, and tie it by a reef knot to the upper end hanging over the shoulder, adjusting the length so that the arm is suspended comfortably in the position in which you placed it. Pull the point of the bandage out and turn over the front of the elbow, fixing there with a pin. The points to be noted are:

1) The knot tying the two ends should be on the shoulder. If it is tied at the back of the neck, the weight of the arm will press it into the neck and cause much discomfort.

2) The hand should be kept on a higher level than the elbow, otherwise it is apt to swell.

3) The finger tips should just show outside the bandage.

A small Arm Sling. This is made in a similar way. First the bandage is folded to the size of a broad-fold bandage. Then place one end over the uninjured shoulder. Place the bandage on the middle of the forearm and fix the lower end to the upper as before.

You may improvise a sling by pinning the sleeve to the front of the coat, or by slipping the hand between the buttons of the coat.

Small arm sling.

Scalp bandage.

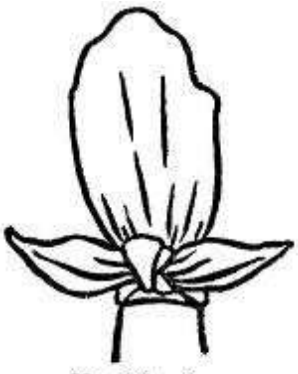
Scalp Bandage. Turn back the base of the bandage for about 1 in. Place the centre on the middle of the forehead, close down on the eyebrows, with the point hanging down behind the head. Carry the ends round the head just above the ears, and either tie at the back over the point or, better, if the ends are long enough, take them round the head and tie off in front. Pull on the point so as to tauten up the whole bandage, turn it up, and fix with a pin.

To keep a dressing on the forehead, the eye, the side of the head, or indeed for any rounded part of the body, a narrow bandage can be used. Place the centre on the dressing, carry the ends round the head, or the limb, and tie off with a reef knot. This is the method used for fixing splints on an arm or leg.

Shoulder bandage.

Shoulder Bandage. Two bandages are required for a shoulder dressing. The first is laid open on the outside of the shoulder, the centre of the base being over the middle of the upper arm and the point running up the side of the neck to below the ear. Turn back the base for about 1 in., carry the ends round the arm, and tie Shoulder bandage off. Make a broad-fold bandage. Lay one end over the injured shoulder, covering the point of the first bandage, and hanging down from the sound shoulder. Sling the arm by tying the lower end of this bandage to the upper end. Pull the point of the first bandage taut, turn down,

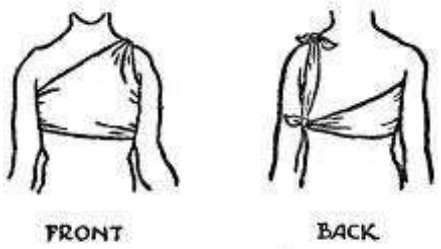
Elbow Bandage. Turn back a hem on the back of the bandage. Lay the centre of the base on the back of the forearm, with the point running upwards to lie on the back of the upper arm. Carry the ends to the front of the arm, cross them below the joint, then back round the upper arm, above the joint, and tie off. Pull the point, turn over, and pin.



Hand bandage.

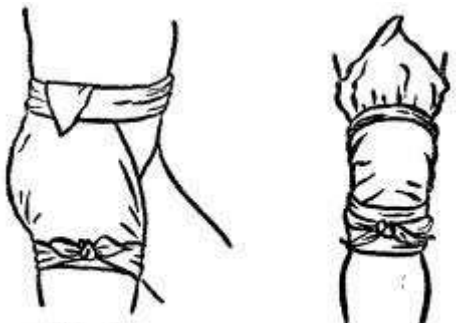
Hand Bandage. Lay the bandage on a table and turn back a hem along the base. Place the hand, palm downwards, on the bandage, with the wrist over the base and the fingers towards the point. Turn the point back over the back of the hand and wrist. Carry the ends round the wrist and over the point and tie off. Pull the point tight, turn over, and pin.

Chest or Back Bandage. Place the centre of the bandage over the dressing on the chest or back, and bring the point over the shoulder on the same side. The two ends are carried round the waist and tied. The point is then pulled down over the shoulder and tied to one of the ends.



Chest or back bandage.

Hip Bandage, Two bandages are needed. One is a narrow bandage tied round the body just above the hip bones, and with the knot on the injured side. The second is laid on the outside of the thigh, with the centre of its turned-back base over the dressing. The ends are tied round the thigh and the point pulled under the first bandage, turned over, and pinned.


Hip bandage. Knee bandage.

Knee Bandage. Turn back a fold on the base of the bandage and lay its centre on the leg just below the knee-cap, with the point lying in front of the thigh. Carry the ends behind and cross below the joint, then in front, and tie off above the joint. In the illustration the ends, being long, have been brought round a third time and tied below the joint. Pull the point tight, turn over, and pin.


Foot bandage.

Foot Bandage. Lay the bandage flat on the ground. Place the foot on its centre with the toes towards the point. Turn the point back over the upper part of the foot. Carry the ends forward round the ankle and cross them in front) then round the instep and tie off. Pull the point tight, and pin.

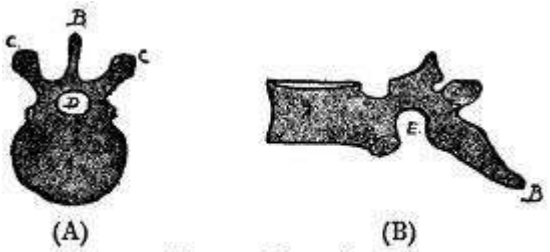
In all your bandaging remember that the object is to keep a dressing or a splint firmly in place, so you must make everything secure. On the other hand, if you pull the bandage too tight you will interfere with the circulation of the blood and cause much pain to the patient. The happy mean is only to be found by frequent practice. For competition purposes neatness is important; but indeed in all cases a neatly applied bandage is likely to be firmer than a slovenly one.

For neatness, work with clean, well-folded material. Where necessary, turn back the hem carefully. Tie all knots by a correct reef knot and tuck away all loose ends. Care and accuracy are here, as in most First Aid work, of more importance than speed.

CHAPTER VII

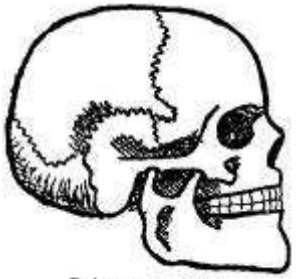
THE SKELETON

YOU must now learn something of the skeleton or frame of the body. Its main piece, to which all the others are attached, is the backbone or SPINE. This is not really one bone, but consists of a number of bones (thirty-three, to be exact, but their number is not important for Scouts) one placed on top of the other. Their shape is something like this.



A bone of the spine.

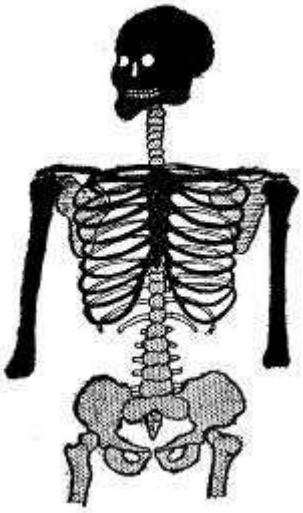
A is a round, solid piece of bone. From behind it run bony arms (B and C), which encircle a little canal (D). Through this canal the spinal cord – the main cable of the body – runs. In the next sketch, taken from the side, you will notice a notch at E. Through this comes the nerve going from the spinal cord to the body. A pair of nerves are given off from the cord, between each of the bones, and also between each (A) there is a pad of gristle which acts as a cushion, and keeps the bones from jarring. The bones are held fairly tightly together by means of strong bands called *ligaments.*


Joints in skull.

The spine stretches from the skull to the lower part of the back. Here five of the bones are fused together solidly and are joined to the big hip bones on either side. The skull consists of the brain cavity and the face.

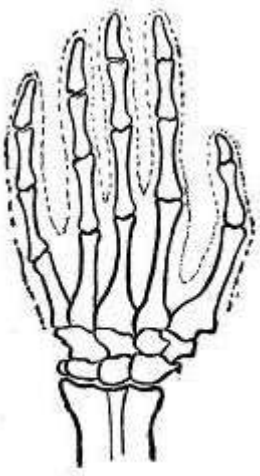
At the shoulder are the two collar bones, small bones running out from the breast bone to the shoulder.

Behind are the shoulder blades – two flat bones lying behind the shoulders. At their outer side is a shallow socket into which the arm bone fits.



Below the collar bones are the RIBS. There are twelve on each side, each pair attached to one bone of the spine behind, and curving round to form the CHEST. The upper seven pairs are fixed to the breast bone in the middle of the chest in front. This is a dagger-shaped bone with the point downwards. The next three pairs are fixed to the ribs above them by a gristly substance (cartilage). The last two are not fixed to anything in front and are known as floating ribs.

The arm consists of one big bone between shoulder and elbow, while the forearm has two bones lying side by side. The wrist consists of eight small bones arranged in two rows. These can slide on each other and so allow some movement. The palm has five bones side by side. Each finger has three bones, and the thumb two.



Hand and wrist.

Almost at the bottom of the spine and fixed to the five fused bones are the two big hip bones. These curve round and form a big basin containing the bladder and part of the

bowels. At the side of each is a deep socket to hold the head of the thigh bone. This is a long bone with a rounded head sticking out from the top.

In front of the knee is the KNEE-CAP, a flat bone which you can feel easily. The lower leg has two bones – one strong thick one, the SHIN BONE, and a thinner one outside it.

Ankle and foot.

The ankle is made up of seven bones – a large heel bone and an ankle bone to which the leg bones are fixed. The foot bones are just like the hand – five long bones, then three short ones in each toe, and two in the big toe.

The place where the bones join together is called a **JOINT.** There are:

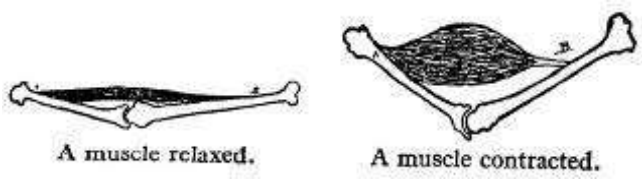
A. Movable joints.
B. Immovable joints.

Movable joints are of three kinds:

1) Ball and socket joints, e.g. hip joint.
2) Hinge joints, e.g. elbow or knee.
3) Sliding joints, e.g. spine or wrist.

An example of an immovable joint is the skull, where the separate bones are dovetailed into each other.

Bones are held together by thick bands called LIGAMENTS, and between the bony surfaces are pads of gristle. Each joint contains a little fluid which oils it and allows the bones to move easily on each other.



A muscle relaxed. A muscle contracted.

Muscles are the red flesh of the body, and it is they which cause the limbs to move. They are arranged in long bands and can be made to thicken and so get shorter at will. The ends are attached to different bones, and as the muscles shorten, the bones are brought together. The sketch above will explain it.

You will notice that the end of the muscle B is attached to the bone by a thin cord. This is a leader or tendon. (Instructors can demonstrate this by means of two sticks jointed together. An empty toy balloon fixed to the ends of the sticks with string acts as the muscle. As it is

pulled sideways, or inflated, it shortens and pulls on the strings and so moves the sticks. The upper stick A should be fixed so that it cannot move.)

The muscles of the heart, bowels, etc., are not under our control – that is, we cannot cause them to move when we will.

CHAPTER VIII

FRACTURES


A normal leg.

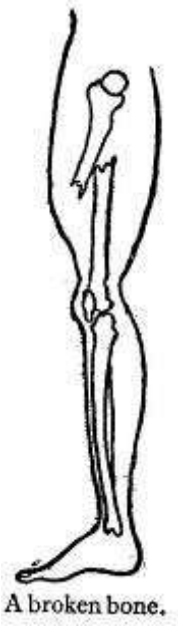
BROKEN bones, or fractures as they are called, are of three kinds:

A. *Simple Fractures.* In these the bone is broken, but the skin is intact, so that there is no place of entry for germs.

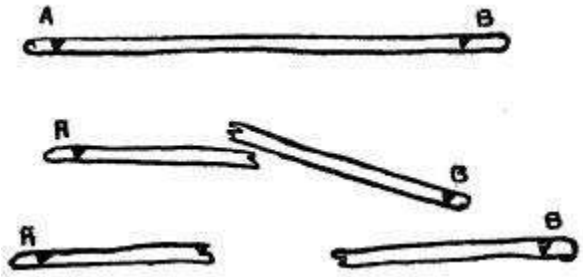
B. *Compound Fractures.* These are much more serious injuries, as, in addition to the damage to the bones, the skin has been cut, and dirt and germs may have been driven in.

C. *Greenstick Fractures.* These occur only in young people, where the bones are not yet hardened. As the name suggests, the fracture is partly bend and partly break.

How are we to recognise a broken bone? Generally we cannot see it, but there are certain signs which indicate that a break has occurred. It may help us to remember what these are if we demonstrate with a stick.


A broken bone.

Take a piece of stick about 2 ft. in length and make notches round it 2 or 3 in. from the ends. These notches represent the joints at either end of the bone. So long as the stick is unbroken it is obvious (1) that the two notches must remain the same distance apart; (2) that the line between them must always be straight, with no bends or angles intervening; (3) that if you move one end, the other end must also move.



Now break the stick midway between the notches. What results?

(1) The notches may now be farther apart, or they may be nearer because the broken ends may overlap.

(2) The stick may now have an angle between the two notches.

(3) One end may be moved without affecting the other end.

There you have three of the chief signs of a fracture.

(1) Lengthening or shortening of the bone. (In a limb this is measured by comparing with the sound limb.)

(2) Unnatural position, and

(3) The limb can be moved in an unnatural way, i.e. you can bend it. (Don't try for this sign.)

(4) Loss of power. The lower broken end cannot be moved by movement of the upper part.

Other common signs are:

(5) Pain.

(6) Swelling at the break. This may be due to the overlapping of the broken ends, or to bruising of the soft parts round it.

(7) *Crepitus.* This means a grating sound or sensation which you can hear or feel when the two broken ends rub against each other. It is very painful, and you must never try to cause it.

Remember that you will not often get all these signs. Nos. 1, 2, 3 and 7, if present, are almost certain signs of fracture. The others may be caused by simpler injuries. In a doubtful case use your common sense and treat as a fracture. Putting on a splint will do no harm to a sound limb. Omitting to do so where there really is a fracture may do much harm.

Having decided that the bone is broken, what are you going to do? Just pause for a moment and try to visualise the conditions under the skin and muscles. Instead of a long smooth rod down the centre of the limb you have a broken rod with sharp, jagged edges. If these jagged edges are allowed to move about, what is going to happen? Obviously, if they come in contact with soft parts, they are very likely to tear them. You may have the sharp end poked up through the skin, transforming a simple to a compound fracture; or the bone may pierce a big blood vessel and cause very serious bleeding; or a nerve may be cut. Go on thinking, and you will see the line of treatment needed. You must so fix the bones that the broken ends cannot move about and do more damage. That is your job – not to "set" the bone, but to prevent further damage. This must be done at the very earliest possible moment after the accident and before the patient is moved at all.

If the fracture is a compound one, the wound must be treated first by washing well and putting on a dressing.

Support the injured limb and prevent its movement. Very gently and without using force try to replace the limb in a natural position. If it is shortened, pull very gently and get someone to hold it while you apply the splint.

SPLINTS are usually made of wood, cut in suitable lengths for different bones. They must be long enough to extend from a point well beyond the joint above the break to a point well beyond the joint immediately below the break. Prepared splints are seldom at hand when an accident occurs, so you may have to improvise. Anything long enough, and strong enough not to bend, will do. A Scout stave, a walking-stick, an umbrella, tightly rolled newspapers, or straight piece of wood – these are some of the things which can usually be got. If possible, pad the splint with some soft material and then fix to the limb with triangular bandages, handkerchiefs, etc., being careful not to fix them so tightly as to interfere with the circulation.

As the patient is probably suffering from shock, cover him up with an overcoat or rug. In a simple fracture it is not necessary to remove the clothes, but put your splints on top of them.

In the case of an arm or leg, where no splints can be got, bandage the arm to the body, or the leg to the other leg.

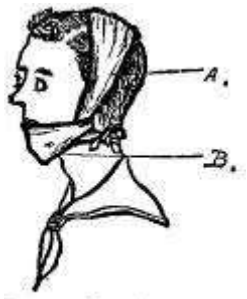
In all cases send for a doctor, or, after putting on splints, take the patient to one.

We now describe fractures of different bones in the body, but the principles of treatment are those given above, differing in details only.

Fracture of the Skull. There is very little for a Scout to do here. The patient may be unconscious from the start, or may become so gradually. There is sometimes some bleeding from the ears. Wipe away the blood, but do not try to stop it by plugging.

If there is an open wound, clean and dress it and bandage very lightly. Lay the patient on his back with the head slightly raised, see that there is nothing tight round the neck, apply cloths wrung out of cold water to the head, and keep him quiet until the doctor comes.

Fracture of the Lower Jaw. This sometimes happens in a fight or may be caused by a fall. You will notice that the teeth are irregular and the jaw appears to be out of shape. There is difficulty in moving it, or in speaking, and there may be some bleeding from the gums.



Lower jaw fracture.

Treatment. Very gently press the lower jaw upwards against the upper jaw. Place the centre of a narrow-fold bandage under the jaw and carry one end (A) up the side of the face over the top of the head and down the other side to the angle of the jaw where it crosses the other end (B). The latter is now taken in front of the chin and round the back of the head to meet A. Tie off with a reef knot.

Fracture of the Spine. This is so serious that *unless it is absolutely impossible* to get a doctor the Scout should not attempt to do anything except to keep the patient quiet and warm. If the fracture occurs high up in the spine, instant death occurs. If lower down, all power of movement and all feeling are lost in the parts below. In transporting such a case – and this should only be done under a doctor's supervision – the greatest care must be taken not to allow the back to bend.

Fractured Collar Bone. This is a very common "Rugger" accident. The shoulder drops forward, and the patient usually supports the elbow on that side with the opposite hand. Place a large soft pad in the armpit. Lay an open bandage on the chest as for an ordinary arm sling and bend the arm across it. Pass the lower end of the bandage over the forearm and between the elbow and the chest, and tie at the back to the other end which lies over the uninjured shoulder.

Pass a broad-fold bandage round the elbow and body to keep the arm tightly fixed to the side.

Fracture of Upper Arm. There will be the usual signs of fracture. When the break is close up to the shoulder, bind the arm to the body by a broad-fold bandage, and support the forearm by a small sling. When lower down, place the forearm at right angles to the upper arm. Put splints,

stretching from the shoulder to the elbow, outside and inside the arm, and others in front and behind (these last are not absolutely necessary). Fix with bandages above and below the break, and support the forearm by a small arm sling. Be careful that the ends of the splints do not press upon the blood vessels in the armpit or at the elbow.

Fracture of the Bones of the Forearm. Either one or both may be broken, but the treatment is the same in either case. Place the arm at right angles to the upper arm with the thumb upwards. Pull gently on the hand, and apply splints in front and behind from the elbow to the fingers. Support by a large arm sling.

Fracture of Bones of Wrist, Palm, or Fingers. Apply a broad splint to the palm, extending from above the wrist to beyond the fingers. Fix by means of a narrow-fold bandage applied in figure of 8 fashion and support in a large sling.

Fractured Ribs. Injury to the ribs is often the result of road accidents where a wheel has gone over the chest, or it may be caused by a fall or blow. The seriousness of the injury depends on whether the broken ends have been driven inwards so as to damage the parts underneath, e.g. the lungs or the liver. Where a rib has been broken, but is still in its proper place, roughly parallel to the rib above and below it, the only signs are pain, especially on drawing a long breath, and very shallow breathing.

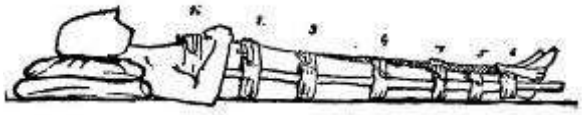
FRACTURES

Treatment. Apply two or three bandages overlapping each other fairly tightly round the chest at the level of the break, and tie off in front at the side away from the broken rib. A towel folded to about 8-9 in. wide and fastened by safety-pins makes a good bandage. Support the arm on that side in a sling.

Where the broken ribs have been driven into the lungs the patient may spit up frothy blood; while if the liver or other organs are injured you will find the signs of internal bleeding. In this more serious condition do not apply bandages to the chest (unless the fracture is a compound one, in which case bandage very lightly). Lay the patient down, keep him quiet, give him sips of cold water, i.e. treat as for internal bleeding.

Fracture of the Hip Bones. This, like fracture of the spine, should not be treated by Scouts. Make the patient as comfortable as possible and keep him quiet.

Fracture of the Thigh Bone. While we shall describe this fully, it must be realized that fracture of any of the leg bones is a serious injury, the treatment of which should not be undertaken lightly by Scouts. If there is the prospect of getting a doctor speedily, make the patient as comfortable as possible and wait. If you have to act, or if the patient has to be moved, proceed as follows;



Fracture of the thigh bone.

Do not remove the clothing unless there is bleeding, and you must do so to get at the wound. Take hold of the foot and pull gently to straighten the leg. If you are alone, tie the foot to the other foot by means of a narrow-fold bandage. If you have help, one Scout remains holding the foot, while the others prepare and apply splints. One long splint is applied stretching from the armpit to just beyond the foot, and a shorter one on the inside of the leg from the fork to the ankle.

No. 1 bandage goes round the chest.

No. 2 round the body at the level of the hips.

No. 3 round the leg immediately above the break,

No. 4 round the leg immediately below the break.

No. 5 round the lower leg.

No. 6 round both ankles, binding splint and feet together.

No. 7 a broad-fold bandage round both knees.

Be very gentle in pushing the bandages under the body and leg. Where you are alone, or where the patient is a woman, you do without the inner splint. First tie the feet together; then apply the long splint and put on the bandages in the same order, but put them round both legs in all cases.

This injury is essentially one for team work. As in all accidents, the P.-L. or senior Scout present takes charge. One boy holds the foot, another pads the splint and holds it in place, while a third bandages. The others fold the bandages, go for the doctor, prepare a stretcher, etc. There should be no confusion or shouting; in fact, the P.-L. is the only one who needs to talk at all. If you keep your heads, the onlookers will see that you know what you are doing; but if you fuss and tumble over each other, they will probably interfere to rescue the patient from your tender mercies.

When the doctor comes he will appreciate your help if it is given quietly, and if he sees you know what you are about; but don't fuss and don't ask questions until the job is over.

Fracture of the Knee-cap. This little bone occasionally gets snapped in two even with no direct blow. The signs are pain and loss of power in the leg below, while you can feel the gap between the two halves.

Sit the patient on the ground with back and shoulders supported. Raise and straighten the leg. Apply a long splint to the back of the leg from the hip to the heel.

Place a narrow-fold bandage with its centre immediately above the upper half of the broken bone. Pass the ends behind, cross them over the splint, and tie in front immediately under the lower half of the broken bone. Place a second bandage with its centre under the lower half, cross on the splint behind, and tie off above the upper half in front. Fix the splint by bandages to the thigh and lower parts of the leg. Raise the foot off the ground by a log, pillow, etc. Cold-water cloths applied to the knee will help to relieve pain.

Fracture of lower Bones of Leg. One or both bones may be broken. When only one is broken, you will not expect to find signs of shortening or unnatural position.

Treatment is similar to that for a broken thigh. Pull on the foot, apply splints from above the knee to below the foot, rising as in the former case.

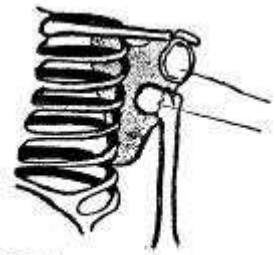
If alone, or in the case of a woman, use only one splint and pass the bandages round both legs.

Fracture of Foot. This is sometimes caused by a vehicle passing over the foot. Pad a splint thoroughly and apply it to the sole of the foot. Fix by a figure of 8 bandage. The centre of the bandage is placed on the top of the instep. Cross the ends on the splint below, carry behind the heel, and cross. Cross again in front of the ankle and tie off under the splint.

CHAPTER IX

DISLOCATIONS AND SPRAINS

SOMETIMES it happens that a sudden jerk or strain pulls the bone farther away from the joint than usual. The ligaments holding it stretch a little, and when the strain ceases the head of the bone may slip past its socket and become fixed above, below, or to either side of the socket. This is called a DISLOCATION, because the bones are misplaced. The signs are:



Dislocation at shoulder.

(a) Sudden pain.

(b) The limb cannot be moved, and is often fixed in an unnatural position, e.g. in a shoulder dislocation the arm may be fixed sticking out from the side.

(c) Swelling. The head of the bone can often be felt, and also the empty socket.

(d) Loss of power.

(e) Numbness below the joint.

Compare these with the signs of a break, and remember you must not expect to find all of them.

Treatment. DO NOT TRY to replace the bones. That is no job for a Scout. Support the limb by bandages, or otherwise, in the most comfortable position, and leave the treatment to the doctor. Treat shock, of course, if it is present, and you will give some relief by applying cold wet cloths to the joint.

SPRAINS

We have noted above that a sudden pull or jerk may stretch or even tear some of the ligaments or bands round the joint. This is called a SPRAIN. The signs are:

(a) Pain.

(b) Swelling.

(c) The joint feels hot.

(d) Later there is discoloration from the bruising.

Treatment. Bathe the part with cold water and apply cloths wrung out of cold water. These must be kept wet. If this fails to give relief, hot water may be used instead. The joint must then be rested for some days.

A sprained ankle is very common. If it happens outside, do not remove the boot, but put a bandage over it. Dip foot, boot, and bandage into cold water and get the patient home. There remove the boot and go on with the treatment as above.

STRAINS

This occurs when doing some violent exercise. It is a straining or perhaps rupture of a part of a muscle. There is a sudden sharp pain at the injured place: the muscle may cramp and cannot be used.

Very gentle rubbing may relieve the pain. If not, put the patient into a comfortable position and apply hot fomentations.

Perhaps a word as to the preparing of hot fomentations might come in here. Usually plain white lint is used, but flannel or other soft material will do. Cut the lint twice the size necessary to cover the pan. Place it in a handkerchief and dip into a bowl of very hot water. When it is thoroughly well soaked remove it and, holding the handkerchief by the dry ends, wring out most of the water by twisting the ends. Open the handkerchief and lay the hot damp lint doubled on the part to be treated. Cover as quickly as possible by a piece of oiled silk and some cotton-wool and fix by a bandage.

CHAPTER X

UNCONSCIOUSNESS

THIS is rather a difficult chapter, so get your thinking-caps on and attend carefully.

You may have seen a motor-cycle standing by the side of the road, with the engine running slowly, but no rider to be seen. Although the engine is still running, the cycle cannot move until someone comes to put the gears in; and if it did start off, it would run quite aimlessly, paying no attention to the messages from other traffic.

That is unconsciousness. The body is still alive, the heart, lungs, and other organs are still working, but the brain is no longer controlling the machine. This occurs to all of us every day, but we don't call it unconsciousness; we call it *sleep.* Just as there are various stages of sleepiness – light sleep from which we are easily roused, and deep sleep – so there are various degrees of unconsciousness.

The first stage is merely drowsiness. The patient is rather dazed and stupid, but can easily be roused.

In the second stage he appears to be in a deep sleep, but can still with difficulty be got to respond to shaking or loud shouting. He probably will not speak, but will show by movements or mumbling that he can hear you.

In the third stage nothing will rouse him, either shouting, shaking, or even pain. This condition is often preliminary to death.

Do not imagine that there are three clear-cut divisions. They merge into each other, and frequently one cannot be sure at which stage the patient is.

Let us suppose you have found someone lying unconscious by the side of the road. To treat him intelligently you must try to make out the cause of his condition. What, then, are the causes of unconsciousness?

(1) *Violence.* He may have fallen, or may have been struck on the head. In that case you would expect to find a wound on the head, and perhaps injuries elsewhere, or signs of a struggle. (If there are marks of feet or motor tyres close by, try to avoid wiping them out, and after attending to the patient make a sketch of them.)

Injury to the head may cause unconsciousness in three ways:

a) The skull may be fractured and a piece of bone may be pressing on the brain. Treat as for fractured skull.

b) A blood vessel may have been ruptured, and the blood pouring out inside the skull has formed a clot which is pressing on the brain. The face is flushed and the breathing noisy. Raise the head a little, dress any wound which may be present, and apply cloths wrung out of cold water. Do not merely sprinkle on the cold water, but keep the cloths wet and cold. Do not move the patient if possible; but if that is necessary, carry him on a stretcher with the head raised.

c) Concussion or stunning. This may cause only a few minutes unconsciousness, and then the patient is dazed for a time. It may, however, pass into (6) above, so the patient should be carefully watched and made to lie down for a few hours in a quiet, darkened place. His face is pale, and breathing quiet. Sprinkle cold water on his head, which should be kept low. A pale face and feeble pulse after an accident may be due to severe loss of blood. In that case, dress the wound to prevent further bleeding first of all.

Other accidents producing unconsciousness are drowning, poisoning by gas, etc., which will be dealt with later.

(2) Unconsciousness may, however, occur from illness without any violence. The one most often met is *Fainting.* This occurs in stuffy crowded places, and is more common in women than men. It varies in degree from a sick, giddy feeling to complete unconsciousness. The signs are:

1. Face pale.
2. Breathing quiet and shallow.
3. Pulse very weak.

The patient requires fresh air, so get him or her out of the crowded room, or open the windows. Don't allow people to crowd round. See that there is no tight clothing round the neck, and sprinkle cold water over the head. If you can get some sal volatile, i.e. spirits of ammonia, or whisky, mix one tablespoonful with a tablespoonful of water and give to the patient, provided he is able to swallow. Hot tea or coffee or hot milk are other excellent stimulants.

You will notice that the first sign above is "Face pale." That means there is not sufficient blood going to the brain. Therefore lay the patient down with the head low.

(3) *Strokes.* In the next condition the signs are just the opposite:

1. Face is flushed.
2. Breathing is loud.
3. Pulse is strong and bounding.

Various names are given to this – shock, fit, etc., but we shall keep to the word used as a heading to avoid contusion. A STROKE usually occurs in old people. As the flushed face

shows, there is too much blood in the head, so lay the patient down with his head and shoulders raised from the ground. Apply cold wet cloths or ice to the head, and keep them wet and cold. Hot bottles may be put to the feet to draw the blood downward, but remember the warning against burning the patient. As in fainting, give fresh air and loosen clothing round neck and chest.

Note, then, the different treatment depending on whether the face is pale or flushed. In both – fresh air and loosened clothing. When the face is pale, common sense tells us to try to increase the blood supply in the brain by keeping the head low and giving a stimulant – sal volatile or a little whisky.

When the face is flushed keep the head high, and on no consideration give a stimulant.

(4) *Drunkenness.* This is a condition which may closely resemble a stroke. Don't fall into the error, however, of thinking that if you can smell whisky on an unconscious person, he is therefore drunk. The "man in the street," in the mistaken kindness of his heart, imagines whisky to be the sovereign remedy for all ills, and has probably tried to administer some to the patient before you arrived, or possibly the patient, feeling ill, has taken some himself before he became unconscious. Although the signs of drunkenness are very similar to those of a stroke, the man is usually not so helpless, and can be roused to some extent. The skin under the clothes is hot in a stroke, cold in drunkenness. If you look at the eyes you will find the pupils (the round black centres of the eyes) the same size in each. If the patient has had a stroke probably the pupils will be of different sizes. If in doubt, treat as a stroke.

There is another form of unconsciousness known as *Heat Stroke.* As it only occurs to those who have been exposed to great heat, or to the direct rays of the sun beating down on the exposed head or neck, it is easily recognised. The first signs are sickness, giddiness, and headache. Later there is difficulty in breathing. The pulse is very fast and bounding and the skin becomes very hot, while the patient becomes unconscious.

This is a very dangerous state, and vigorous treatment is needed. Get the patient into a cool, shady place. Strip him to the waist and lay him down with the shoulders well raised. Fan him vigorously.

Apply cold-water cloths to the head, back of neck, and spine (ice, if you can get it), and keep them thoroughly cold until the signs subside. In mild cases the patient must lie down in a cool and shady place for some hours with frequently renewed cold-water dressings on the head. Remember heat stroke may occur even in our summers, so be careful not to expose your head and back too freely in a hot sun.

In all these different forms of unconsciousness one of the most important matters which you must never forget is to send at once for a doctor.

FITS

These are conditions easily recognised. The arms, legs, and sometimes the whole body are jerking violently.

Don't try to restrain the patient, but prevent him from injuring himself. He may bite his tongue by snapping the jaws together, so hold a piece of stick between the teeth.

There is a form of fit sometimes seen in women called hysteria. The patient screams, laughs, and sobs alternately, and may throw herself down. If she does, you will notice that she does not do so in such a way as to hurt herself, but falls into some convenient couch or chair. She is not really unconscious and is hoping for your sympathy, but don't give her any. Pay no attention at all, or else speak very firmly and unfeelingly. A little douche of cold water is very effective at times.

Fits due to poisoning will be dealt with later on.

CHAPTER XI

FUEL FOR THE HUMAN MACHINE

JUST as the liquid petrol has to be turned into vapour before it enters the cylinder of the motor-cycle, so the food we eat has to be altered very greatly before it can enter the blood-stream and supply fuel to the different parts of the body.

This change is called DIGESTION. It begins in the mouth. As soon as any food enters the mouth, certain juices are poured out which mix with the food and begin to act on certain parts of it. The thought or sight or smell of food causes these juices to flow, and so the expression "to make the mouth water" is literally correct.

This mixing of the juices with the food is very important, so all food should be thoroughly chewed up before being swallowed. If you bolt your food when you are young, you will probably pay for it by having indigestion when you are older.

The food now passes down the gullet to the stomach. This is a pear-shaped bag lying just below and to the left of the breast bone, slightly below the heart. In the stomach more juices are poured out which act on other parts of the food, and the whole mixture is churned round and round by the action of the muscular walls, until it is all a thick, creamy, and partially digested liquid. Then, and not until then, the lower mouth of the stomach opens and the contents pass out into the small bowel, where still more juices mix with and completely digest them. The food is now in a suitable state to pass through the walls of the bowels and into the little canals which run all round the bowels. From the canals it passes into the main bloodstream and is distributed to all parts of the body.

The small bowel is a tube about 20 ft. long and lies coiled up in the space between the lower parts of the ribs and the hip bones.

All the food we eat is not capable of being digested and taken into the blood, so after all the valuable parts have been used there is a good deal of waste material left. This passes on into the large bowel – a much bigger, i.e. more capacious, but shorter tube. The food remaining ought to be passed from the large bowel about twenty-four hours after it has been eaten. If it does not, it clogs up the bowel and soon begins to poison the whole body. That is why it is so important that Scouts should go to the latrines every day.

There you have one way in which the body disposes of its waste material; but there are three others.

When muscles are working, CO_2. (carbon dioxide) is formed. It is a poison, and must be got rid of. It is carried off by the blood and eventually reaches the lungs, where it passes into the air and goes out of the body in our breath.

A good deal of waste material passes out through the skin in the form of sweat. The skin has got millions of little openings called pores, through which the sweat goes. If these get clogged, the body slowly suffers.

(*Moral.* Keep your skin clean and the pores open. If you can't get a bath often, you can always get a rub down with a damp towel.)

The last channel for waste matter is the kidney. There are two of these, one on each side of the spine, just about level with the lowest ribs. They take fluid from the blood and pass it by two small tubes into the bladder, which lies just behind the junction of the hip bones in front.

POISONS

The only First Aid which a Scout is likely to have to give for injuries of the stomach and bowels is in cases of poisoning. Poisons are usually taken by people who wish to kill themselves, but they may be swallowed accidentally, or may even be given by other people with murderous intent. In all cases the Scout must be specially careful to note any signs left round the patient, and to avoid destroying them. If a bottle or glass is lying near, he must preserve it and its contents, and he should also keep any matter which the patient may have vomited.

The usual signs of poisoning are these:

a) Pain in the pit of the stomach.
b) Faintness.
c) Cramp in the limbs,
d) Stains about the lips.
e) Unconsciousness.

Only some of these may be present, e.g. if a patient is unconscious, obviously he has not pain or cramp.

Treatment. First, send for a doctor. Look closely at the lips and inside of the mouth for stains. If present, they are burns caused by the strong acid or alkali which the patient has swallowed. The acid has burned not only the lips, but the gullet and walls of the stomach, and if the patient vomits there is a great risk of the partly burned wall giving way, and of the stomach bursting. Where there is evidence, then, of the poison being a burning one, shown by stains on the lips, DO NOT GIVE ANYTHING WHICH WILL MAKE THE PATIENT SICK.

You must first try to neutralise the poison in the stomach. You may see by the label on the bottle that he has swallowed a strong acid. Common ones are:

Sulphuric Acid or Oil of Vitriol.
Hydrochloric Acid or Spirits of Salt.
Strong Carbolic Acid or Phenol.
Oxalic Acid, which is present in Salts of Sorrel and Salts of Lemon.

In that case give lime water or one table-spoonful of whiting, chalk, magnesia, or crumbled plaster from the wall in a tumblerful of water. Afterwards give milk, raw eggs beaten up in milk or water, or flour and water.

Where you know a strong alkali has been taken give a weak acid. Common alkalies are:

Caustic Potash.
Caustic Soda.
Strong Ammonia.

Give lemon or orange juice, or vinegar, each mixed with an equal quantity of water. Then give eggs, milk, or flour as above.

Where there is no staining of the lips, mouth, or tongue we must try to get rid of the poison by making the patient vomit. This is done by giving an emetic. Common emetics are;

(a) One or two teaspoonfuls of mustard in a tumbler of lukewarm water.
(b) A tablespoonful of salt in a tumbler of lukewarm water.
(c) Tickle the back of his throat with your fingers or a feather.
(d) A tumbler of lukewarm water.
(e) A tumbler of lukewarm water and soap-suds.

After the patient has vomited thoroughly, or, in any case, if you fail to cause vomiting, give milk, eggs, flour and water, and strong tea. This is always safe. It is made by throwing a handful of tea into a kettle and boiling vigorously.

To sum up:

Send for the doctor.

Where there are stains on the lips, give something to neutralise the acid or alkali, followed by milk, eggs, etc. Do not give an emetic.

Where there are no stains, give an emetic and follow by milk, eggs, etc.

CHAPTER XII

THE AIR INLET

A FREE supply of air is absolutely essential to the human machine. If by any means the supply is cut off, the engine fails, and death results in a very few minutes.

Air enters the body through the nose or mouth, but, as the Chief tells you in *Scouting for Boys,* nose breathing is good, mouth breathing is bad. Why? If we breathe through the mouth, air goes straight into the lungs, dusty and full of germs, sometimes warm, sometimes cold, sometimes too damp, sometimes too dry. If, after sitting in a warm room, we go outside into the cold, the lungs suddenly get great draughts of cold, damp, raw air. Do you wonder they don't like it?

Air passing first through the nose is warmed and the dust and many germs removed from it, and if it is too dry moisture is added to it. See to it, then, that you use your nose for the purpose for which it was given you, and ensure for your lungs a steady supply of purified air at a suitable temperature.

When the air has gone through the nose into the back of the mouth it passes into the wind-pipe. This is a tube made up of a number of rings of gristle, which you can feel as it runs down the front of the neck from under the chin to behind the breast bone. There it divides, one-half going to each lung.

The lungs fill up nearly the whole space enclosed by the ribs. They are rather like two big sponges with all their tiny cavities full of air. You will remember how the blood flows in tiny capillaries in the walls of these cavities, and how carbon dioxide gas passes from the blood into the air, while oxygen replaces it in the blood.

The lungs are fixed to the inside of the chest wall by the force of suction, just as a wet rubber "sucker" sticks to the pavement. As they arc elastic they can contract and expand, and it is this movement which alternately forces out and then sucks in the air. This occurs with the rising and falling of the chest wall, usually at a speed of about eighteen times every minute. When your muscles are working hard they use up much more oxygen than they do when resting, so the lungs must move faster to supply it. That is why you pant when you run fast.

Now consider how the air supply may be cut off. No air may be able to get into the nose or mouth. This is what happens in drowning, or in getting buried in a fall of earth or sand. You remember, too, how the Princes in the Tower were killed by having pillows held over their faces.

The supply may be cut off by pressure on the windpipe from outside, so that no air can pass through it. Examples of this are hanging or strangulation.

Occasionally something gets stuck inside the windpipe and blocks the passage completely. This is called choking.

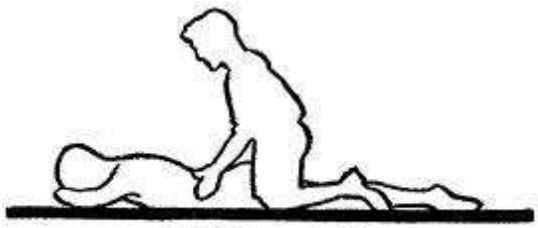
Whatever the cause, unless you relieve the stoppage quickly and allow free entry of air, the patient will die in a very few minutes.

Drowning. The knowledge of how to deal with an apparently drowned person is so important that it should be thoroughly learned and practised, attention being given not only to the method of restoring breathing, but also to all the other details. It is an excellent opportunity for team work.

Having removed the patient from the water, lay him on the ground, face downwards. Quickly loosen any tight clothing round the neck or chest, and, putting a finger in his mouth, make sure there is nothing (e.g. seaweed) preventing the free entrance of air to the windpipe.

Turn up one of his arms so that his head may rest on it, with his face turned towards the opposite shoulder. This is done to ensure that air gets freely to his mouth and nose. Then kneel down beside or astride of his body, facing towards the head. Lay your open hands over his lower ribs, with the thumbs lying parallel to each other on either side of the spine, and the fingers spread out.

Keeping your arms straight, swing your body forward from the hips, so that its weight presses on the chest of the patient and squeezes out the air. While doing this count three slowly. Then, still keeping your hands touching his chest, swing your body back, so that there is no longer any pressure on the chest, counting two meantime. Keep on with this rhythmical swing twelve or fourteen times to the minute, until the breathing starts, or until the doctor tells you to stop. Remember that patients have recovered after appearing to be dead for two or three hours, so don't give up trying too soon. When one boy gets tired another should slip into his place, trying to do so without disturbing the rhythmical sequence of the swing.



Artificial respiration.

After some time the patient may gasp and make some effort to breathe. Then you must watch very carefully to make your squeezing and relaxing fit in with the efforts of the patient. Even after natural breathing has begun, stand by ready to commence again if it shows any signs of failing.

This is what is known as Artificial Respiration, a method devised by Schafer, and called Schafer's Method.

While one or two boys are employed in this way, the P.-L. is preparing for the after treatment. He sends one Scout for the doctor, another goes to get blankets, hot bottles and hot drinks, while another arranges a bed for the patient in a tent, or the nearest convenient house. When dry blankets have been obtained the wet clothing should be removed, but this must not be allowed to interfere with the all-important duty of keeping up artificial respiration.

After natural breathing has been restored try to stimulate the circulation by rubbing his limbs with the hands or towels. Always rub upwards towards the heart to help the flow

of blood. Then cover the patient up warmly and put covered hot bottles round him. When consciousness returns give hot drinks, tea, coffee, hot milk, hot soup, etc., and after getting him to bed let him sleep for a time.

Hanging. People in great trouble sometimes kill themselves by hanging, and it may happen that you have to deal with such a case. Unless you are on the spot within a minute or two, the chances of restoring life are practically nil.

The weight of the body is causing the rope by which it is suspended to press tightly round the neck. Relieve this pressure by trying to raise the body a little bit, while someone cuts or loosens the rope. Then let the patient down and try artificial respiration. When the body is cold and there are no signs of life, send a message to the police and the doctor, look round for any signs and try to prevent onlookers from destroying them.

Choking. This is what happens when something "goes down the wrong way." Both the windpipe and the gullet open into the back of the mouth. There is a flap which closes the windpipe when we swallow, so that nothing can enter it until the food has got properly into the gullet. Occasionally this mechanism fails, food gets into the windpipe, and we get a fit of choking and coughing as the effort of the lungs to blow the food back into the mouth. If the food sticks, however, in the windpipe it may cut off the air supply and cause suffocation.

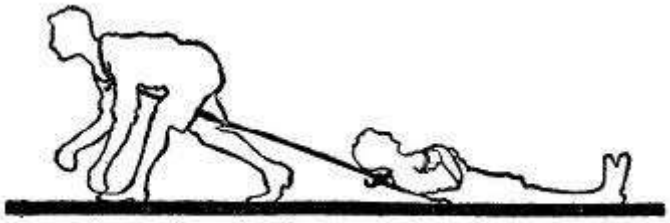
Give the patient some good thumps on the back. Loosen any tight clothing round the neck. Put your fingers into his mouth and try to hook out whatever is sticking in the throat. If the patient is a child, hold him upside down and give him a shake.

Choking may be caused by food sticking high up in the gullet and pressing forward on the windpipe. If you fail to hook it up, then try to push it down farther, and so relieve the pressure.

A fishbone stuck in the throat is not usually a serious injury, but it can be a very irritating one, and if you can give relief you will probably earn a lot of gratitude. First have a good look at the inside of the throat. You may see the bone sticking out. If so, try to seize it with the forceps from your Ambulance Box. If the bone has stuck too far down in the throat to be seen, give the patient doughy bread to swallow, in the hope that the bone will catch in it and be carried down into the stomach.

Gas Poisoning. In an earlier chapter we talked of the poisons which enter the body by the mouth, gullet, and stomach. There are other poisons which, entering by the air passages and lungs, bring about death very speedily. These are in the form of gas, and the common ones we may meet are: smoke, coal-gas, sewer-gas, or the fumes of a motor engine running in a small closed garage.

The first and most obvious thing to do is to get the patient out, but in doing this the rescuer runs the risk of being himself poisoned, so certain precautions must be taken.



Rescuing by means of a rope.

Let us take the case of a person lying in a burning room full of smoke. Cover your mouth with a wet scarf, bandage, or stocking. Keep your head low, because close to the floor the air

is always cooler and purer than higher up. On reaching the patient, drag him out by the collar of his coat, or hoist him on your shoulder by the Fireman's Lift. If he is too heavy for either of these methods then turn him on his back, tie a rope round his chest by means of a bowline knot, the loop being of such a size that his head rests on the knot. Tie a bowline at the other end of the rope round your own neck, with the knot in front over your chest, get down on all fours and crawl to the door, dragging the patient behind you. Use the method which will be quickest – not for his sake only, but for your own.

Having got him out, if breathing has stopped, apply artificial respiration. When breathing has returned, treat shock and burns or bruises, if present.

Common sense will show you how to vary this in varying circumstances. Work out each likely emergency for yourself and what you would do. The method given above will, with common sense, suit most cases of gas poisoning.

Often you will find yourself handicapped by the curiosity of the crowd. Don't lose your temper; explain that the patient needs air, and get the other Scouts, with a happy combination of tact and force, to try to keep onlookers at a reasonable distance.

Finally, in all the cases described above, speed and a clear head are essential. Move quickly, but be sure of your movements. The patient has lost his wind; if you lose your head, neither of you is likely to regain what you have lost in time to be of much service.

CHAPTER XIII

TRANSPORT

IN some accidents Scouts may not be called on to give First Aid, because a doctor or Red Cross man is present or can be got speedily. In such cases Scouts may render good service by devising some means of carrying the injured person to his home, the hospital, or an ambulance.

The various methods of transport are by:

1) Stretcher.
2) Hand-carries.
3) Fireman's Lift.

STRETCHERS

This is the most suitable method when the patient has to be carried a considerable distance. A stretcher consists of two poles about 6 ft. long with a piece of canvas stretched between them. There are various more or less elaborate forms of stretchers which are not generally useful for Scouts, because they are expensive and rather heavy. A very simple stretcher can be made from a piece of canvas 5 ft. 6 in. in length and 5 ft. broad.

Double it over and stitch the edges together so that now you have a double piece of canvas 5 ft. 6 in. in length and 2 ft. 6 in. broad. Stitch the two pieces of canvas together at the sides so as to leave room to insert a Scout stave at each side. You may then cut four openings in the canvas 6 in. from the ends big enough for a hand to pass through. The edges must be hemmed to prevent fraying or tearing.

This stretcher can be rolled up into a small space and carried in a haversack, and is ready for use by merely slipping two staves through the sides.

Improvised Stretchers. Very commonly you will not have a stretcher available. Then you must proceed to make one from any materials at hand. If you can get two sacks, cut holes at the corners and push Scout staves through them.

Quite an efficient stretcher may be made from two jackets. Turn the sleeves inside out, inside the coats. Push a stave through an arm of each and button up the fronts. The buttoned sides are underneath, so that the patient lies on the backs of the coats.

Two Scout jerseys can be used in a similar way. A blanket or two ground-sheets may be used in emergency.

Lay a Scout stave along the outer edges of the blanket. Tuck the edges round the staves and roll them inwards until within 2 ft. 6 in. of each other. Care must be taken while the patient is being carried not to allow the staves to unroll, although the weight of the patient helps to prevent slipping.

A gate taken from its hinges is sometimes used as an emergency stretcher. It is not comfortable and is heavy and unwieldy to carry.

Whatever form of stretcher you may be using, you will add greatly to the patient's comfort by placing a pillow of some sort under his head, and, if he is lying for long, put some covering over his body. Four Scouts act as bearers, and they must remember that probably the patient is in pain, which will be increased by jolting or shaking. They must raise and lower the stretcher slowly and gently, all acting together. The two bearers in front must not walk in step; one steps off with the right foot, the other with the left. So do the bearers behind. Generally, if you are carrying up a slope, or upstairs, the patient's head must be carried higher than his feet.

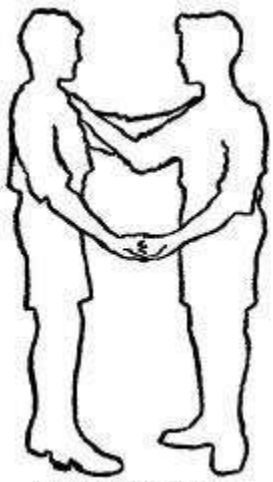
To be done well, without fuss and for the comfort of the patient, stretcher work requires that each fellow should know exactly what to do and when to do it. That means practice and team work. It may be done as stretcher drill, with the P.-L. giving the words of command and the Patrol moving as on parade. This is not essential, but everything must be done in an orderly fashion, with the P.-L. controlling all the stages. Let us try to see how it works. The Patrol doubles up to the scene of the accident, halts a few paces off while the P.-L. and Second or any other boy he may choose go to examine the patient. The P.-L. having decided that a stretcher is needed gives the order "Prepare Stretcher." Nos. 3 and 4 proceed to do so, and lay it down near the patient. When the patient is ready to be lifted, Nos. 1, 2, and 3 go to the left side of the patient, and No. 4 to the other. All turn inwards so as to face each other and kneel down on one knee – the left. They will then pass their hands under the patient – No. 3 under the legs, Nos. 2 and 4 under the hips and back. No. 1 will pass his left hand over the patient's chest and under his right shoulder, while his right hand goes under the patient's left shoulder. On the order "Raise Patient," all will lift slowly and bring the patient on to the knees of Nos. 1, 2, and 3. No. 4 will then disengage his hands, bring up the stretcher and lay it down under the patient. On the order "Lower Patient," all four will then gently lower the patient on to the stretcher. The P.-L. will then order "To your places – march," when Nos. 1 and 4 will go to the front, and Nos. 2 and 3 to the rear of the stretcher. The next order is "Lift Stretcher," then "March."

Where only four boys are present, No. 1 will take charge and give all the orders. If more boys are available, the P.-L. in charge may do so, even if he is not acting as one of the stretcher party.

HAND-CARRIES

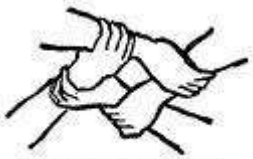
The Two-handed Carry. This is used to carry the patient in a sitting position when he is not able to use his own arms to support himself. The bearers face each other on opposite

sides of the patient. The one on the right-hand side puts his left arm behind the patient's shoulder, the one on the left-hand his right arm. Try to get a grip of the clothing. They then pass their other arms under the patient's thighs and clasp hands. Slowly rising, they move off together, one starting with the left foot, the other with the right.



Two-handed carry.

Four-handed Carry. Two-handed carry. This method is used when the patient can use his arms to support himself.



Four-handed carry.

The bearers face each other and grasp their own left wrists with their right hands, and then grasp each other's right wrists with their left hands. The patient sits on the seat thus formed with his arms round the bearers' shoulders.

These two carries sound very complicated, but you will find when you try them that in reality they are quite simple. One word of warning is very necessary here. It is not intended that by means of stretchers or carries small boys should attempt to lift and transport bigger boys, much less heavy adults, and this should not be allowed in any circumstances. Most boys are plucky and will cheerfully undertake jobs which they are not physically able to do, and, having started, are not willing to give in. This involves danger of seriously overstraining, and great care must be exercised by the S.M. in preventing this. This is especially true of the next means of transport to be described.

THE FIREMAN'S LIFT

Turn the patient with his face to the ground. Stoop down (do not kneel) and raise his head and shoulders by passing your hands under his armpits. Raise him to his knees and shift your grip to lower down on his waist, and again lift until he is on his feet leaning slightly against you. Stoop down to get your right shoulder under his stomach and pass your right hand between his legs. His right arm is pulled forward over your left shoulder and is grasped by your right hand. Then raise yourself, and he will be balanced over your shoulder, held in position by your right arm, while your left arm is free.

You must on no account kneel down, or you will find it very difficult to rise with the heavy weight on your shoulders.

A trek-cart may sometimes be of use for carrying an injured person. Not a very comfortable conveyance, it may be made more so by slinging ropes from side to side to form a sort of hammock. This is then covered by blankets or canvas. If the back and front pieces of the cart have been removed, put some pieces of planking across to act as supports to the side pieces.

CHAPTER XIV

USEFUL INFORMATION

You have now learned how to deal with the common injuries to which the human machine is liable, and something, let us hope, of how that machine works; but not much has been said of the mechanism by which the whole machine is controlled.

The centre of control is in the brain, which is situated in the cavity of the skull, and well protected by its thick bony walls. The brain is connected with all parts of the body by tiny threads, or Nerves, along which messages can pass. The nerves to the head and face, the eyes, ears, nose, and mouth, run directly from the brain to these different parts; but those going to the body are all joined together to form a big cable, which passes out of the skull and down the opening in the spine. This cable is called the Spinal Cord. As it passes through each bone in the spine, two of the nerves leave it, one on either side, and branch off to connect up with the parts near them, so that by the time the cord has reached the lower part of the spine all its nerves have left the spinal canal and spread to the body.

Each nerve then branches in all directions like the branching of a tree, and becomes too small to be seen by the naked eye, until every patch of skin and every organ of the body is directly connected with the brain.

The brain may be compared to the manager of a large factory who, sitting in his office, receives reports by telephone from his agents, his foremen, etc., and so learns all that is going on in his business world and in the factory. After considering these reports, he picks up his telephone again and issues his orders, and all the parts of the factory get busy carrying them out.

The brain is concerned with the business of keeping the body running properly. It gets reports from the outside world by means of the eyes, the ears, the nose, etc. It gets reports from the different parts of the body by means of the nerves connected with them. Then it sends out its orders, and all these different parts proceed to carry them out. Think what occurs when your hand touches something very hot. You pull it away very quickly; but what really happens is that a message has gone from your hand to the brain, and an order has been sent from the brain to the muscles which cause your hand to move.

If by any means these nerves are cut, or if for some reason the brain is not alert to receive the messages, as happens in unconsciousness, then no sensation is felt, and all power of movement in that part is lost.

This sometimes happens in a stroke, where part of the brain has been injured, so that no messages from the part of the body which it controls can be dealt with. The only practical application of this for Scouts is to remember the warning already given about protecting an unconscious patient from burning by hot bottles. Otherwise brain and nerve injuries are outside the scope of First Aid work.

All our talks so far have been of injuries caused by accidents over which we have no control, but a much greater amount of pain and suffering is caused by illness. You may think we have as little control over that, but just think for a moment. If you owned a motor-bike which you never cleaned and seldom oiled, which you allowed to get rusty, which you never overhauled, would you be very surprised if it broke down some day? Many people treat their bodies like that, and then wonder why they feel seedy and unfit. Ours is a very complicated machine, and a reasonable amount of care is necessary if it is going to keep on doing its work satisfactorily. We know that many diseases are caused by germs, but we also know that the body has considerable powers of resistance and can kill and get rid of many of them before they have done any harm.

Now these powers of resistance vary greatly, being strong when we are fit, and poor when we have allowed ourselves to get into poor condition. Then we are easy prey.

As it is impossible to avoid germs entirely, let us see to it that our powers of resistance are as great as possible.

How, then, can we keep fit?

(1) *Exercise.* This is absolutely necessary to keep the body in good trim. It may be that in our work, or by games at school, we get sufficient exercise; but, if not, we must make up for it in some other way. This need not take up very much tune, but should be done regularly each day. The Chief points the way in *Scouting for Boys.*

A word of warning: If you have got soft, do not try to get fit all at once by violent or prolonged exertion. The University boat crews do not row over the full course on the first day of their training, but gradually work themselves into good condition.

(2) *Fresh Air.* Fresh air contains plenty of oxygen. The air we breathe out contains carbon dioxide. This is a poisonous gas, and if we sleep in a room with all the windows closed, the air loses more and more oxygen and becomes more and more full of carbon dioxide. In a small room with many people, death would follow – witness the Black Hole of Calcutta; but though that seldom happens, there is some slight poisoning every night, which gradually affects the health. Therefore keep your windows open, and do your exercise out of doors whenever it is possible.

(3) *Cleanliness.* We have spoken before of how the body gets rid of some of its waste matter through the skin; therefore don't let your pores get clogged up if you want to keep fit.

(4) *Regular movement of the Bowels every day is necessary.* Nothing will more quickly make you feel ill than neglect of this. The change of food in camp may tend to cause constipation, but this can easily be remedied.

(5) *Chills.* Many illnesses begin by getting a chill. This lowers the resistance of the body temporarily, and allows the germs a chance to multiply and to cause illness.

One of the commonest causes is the wearing of wet clothes or stockings. Some foolish fellows think they are very hardy because they don't worry about little matters such as these; but a Scout is not a fool, so when he gets wet he will, as soon as possible, get out of his wet clothes or stockings and into dry ones, or if he has no change of clothing will robe himself in a blanket until his clothes are dry. Wet stockings are very common in camp, but a good Scout will wear stockings very rarely, and never early in the morning when the grass all round is wet. Don't be afraid of being laughed at for attending to these things. It's the fellow who laughs who is the fool – not you.

When you are hot and sweating after football, don't stand around discussing the game until you feel cold and clammy. Get a change and rub down as soon as you can. Read in *Scouting for Boys* how the Chief kept himself fit during a campaign.

(6) *Food.* There is no need to be finicky about your food, neither need you be ashamed of a good healthy appetite. Your meals should be at regular hours, and you ought not to eat too many sweets, cakes, etc., between them. The stomach requires rest after digestion, and this it does not get if you are constantly popping in a few chocolates or other "snag."

(7) *Sleep.* A growing boy requires at least nine hours' sleep every night, and if he does not get it the effect on his health and general fitness will soon begin to show.

(8) *Smoking.* The boy who smokes to any great extent before the age of seventeen or eighteen is not giving himself the chance to grow to his fullest possible size. He will certainly not be so fit as he would be without it, and he is starting an expensive habit probably before he can afford to.

None of these rules of health are very difficult to follow. As has been well said, "Good health is something we never notice until we lose it"; then we realise that without it we can never know the full joy of living.

We have now come to the end of our talks. The instruction given will help a Scout to pass his Second and First Class Tests and to gain the Ambulance Badge, but that has not been the main object of the series.

What our aim in teaching Ambulance should be, is that every Scout may be prepared, not merely to answer questions in a Badge examination, but to be of real service when accidents occur. To help intelligently, he must have an understanding of the structure and working mechanism of the parts affected; he must know the general principles of treatment; and, lastly, but most important of all, he must keep his head and use his common sense.

To train him, frequent practices are needed, and occasionally one should spring on him a faked accident with plenty of red paint, or real blood got from the local slaughter-house.

Ambulance is Scouting's most important technical subject, as opportunities for its use are constantly arising. It is not really a dull subject, nor a terribly difficult one, if a little imagination is used in its presentation.

Choose, then, whether the First Aid of your Troop is to be a Badge-gaining eye-wash or a real preparation for the carrying out of the third Scout Law.

THE END

APPENDIX

CONTENTS OF CAMP MEDICINE CHEST

Bandages –

Triangular. Two or three for use as slings. Roller, 1 in., 2 in., 3 in. Four of each.

Linen – Old boiled linen rags, kept scrupulously clean in linen bag.

Lint –

Boracic (pink). For antiseptic wet dressings.

Plain white. For fomentations, etc.

Oiled Silt.

Cotton Wool – In 2 oz. packets.

Plaster – Adhesive ribbon. For strapping, fixing splints, etc.

Splints – Can be made at home, copied off a surgical instrument-maker's set.

Scissors – Blunt-nosed surgical. Never used for other purposes.

Tweezers or clean Forceps – For removing thorns, etc.

Packet of safety-pins, tape, needles, etc,

Clinical Thermometer – Learn how to read before camp.

DRUGS

(Get all bottles marked by chemist with correct dose.)

Outward application.

Tincture of Iodine – For painting on scratches, etc. Rubber stopper, with small brush fitted.

Permanganate of Potash – A few crystals in bowl of water to make pink solution is a good antiseptic for bathing wounds, or for washing tired feet. For snake bite, rub in whole crystal.

Small tin of baking soda.

Carron Oil – For superficial burns.

Oil of Cloves – ¼ oz – For toothache. Pack tooth with wool soaked in oil.

Lanolin – For painful sunburn, chapped hands, etc.

Citronella Oil – As midge bite preventive.

Ammonia – For stings.

Internal use.

Sal Volatile – A stimulant in cases of faintness.

Castor Oil – For constipation and diarrhœa. ½ to 1 oz. in early morning.

Epsorn Salts – Small teaspoonful or more in tumbler of hot water before breakfast.

Cascara Sagrada – 2 gr. tablets. One or two at night. The latter two should be used for habitual constipation. Castor oil should not be given repeatedly.

Bismuth and Soda, or Soda Mint Tablets – For indigestion or heartburn. If persistent, send for doctor.

Ammoniated Tincture of Quinine – For colds. ½ to 1 teaspoonful in half cup of water will check if taken early. Put boy to bed with plenty of warm blankets. Repeat in four hours if necessary.

Keep these in clean tin box marked with Red Cross. Have list of contents posted inside lid of box.

It is advisable to have also a candle and matches.