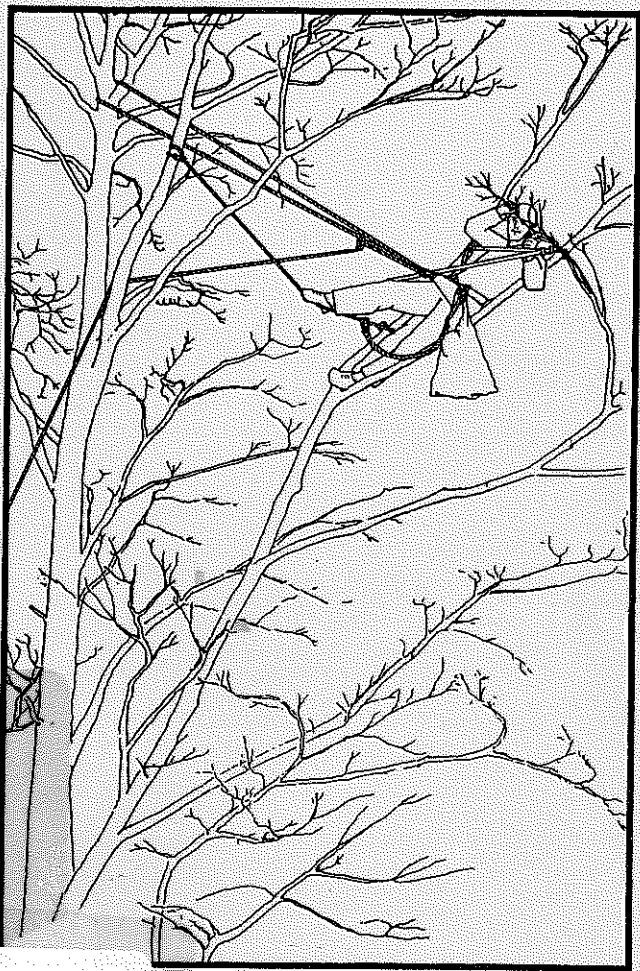


DANIDA FOREST SEED CENTRE



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FE TREE CLIMBING

FOR SEED COLLECTION

PROPERTY OF ECHO

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Safe Tree Climbing for Seed Collection

A check list

Annex to Lecture Note C-4

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INTRODUCTION

To grow good trees we have to collect seed from good parent trees, and to collect healthy seed of good quality we very often have to collect the seed on the parent tree. In many cases this means climbing into the crown of the tree.

Climbing trees to collect seed must be safe and still allow the seed collector to work efficiently in all parts of the crown.

This pamphlet is not a manual in tree climbing techniques. It is a reference and reminder for those who have attended a tree climbing course.

Do not try to teach yourself tree climbing from the following notes. Tree climbing involves a lot more skills and knowledge, and should always be supervised by an experienced instructor.

This check list is an extension of A.M.J. Robbins: Tree Climbing With Spurs (National Tree Seed Project, Nepal, 1987), from which a lot of text and drawings has been borrowed and modified, and material from training courses for The Danish National Tree Improvement Station's seed collection team.

The notes are written in English but space is left open for a local translation.

The equipment used in these notes is the equipment used in Denmark and by the DANIDA Forest Seed Centre.

DFSC technical notes and the lecture note on seed collection describe the types of equipment in detail and list suppliers and prices.

EQUIPMENTList

The following equipment is used in the techniques described in these notes:

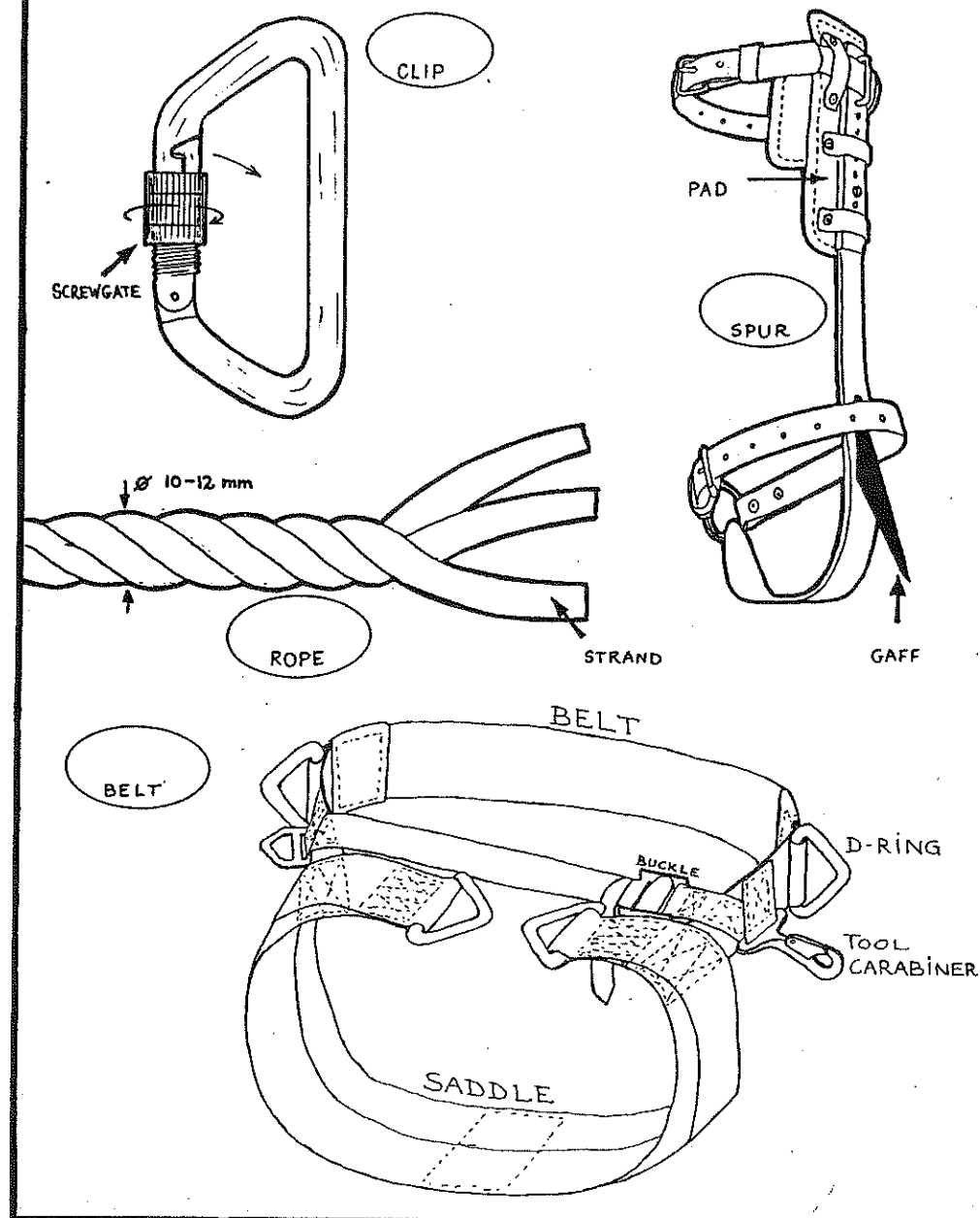
- One pair of climbing spurs.
- Scaling ladder sections (steel tube ladder).
- Safety belt (tree surgeons harness).
- 3 or 4 clips (carabiners) with screwgates.
- The following items made from three-stranded 10-12 mm nylon rope:
 - 2 strops of e.g. 2 and 3 m length with eye splicings at both ends.
 - One prussic loop.
 - One lifeline with a minimum length of double the working height, eye splicing at one end.
- One three-hook with 10m 8mm line.
- The collection tools will depend on tree species and collection method, e.g.:
 - One cutter with a 3-4m long handle.
 - One hookstick with 1.5-3m long handle and strap.
- Strong and comfortable clothes to protect the body.
- Strong boots, when spurs are used, the boots should protect the ankle and have a deep heel.
- Safety helmet or hat to protect the head. Ground crew should always be wearing helmets.
- Picking bags, baskets or sacks.



Names and use

You should know the special names of the different parts of the equipment, and how they are used.

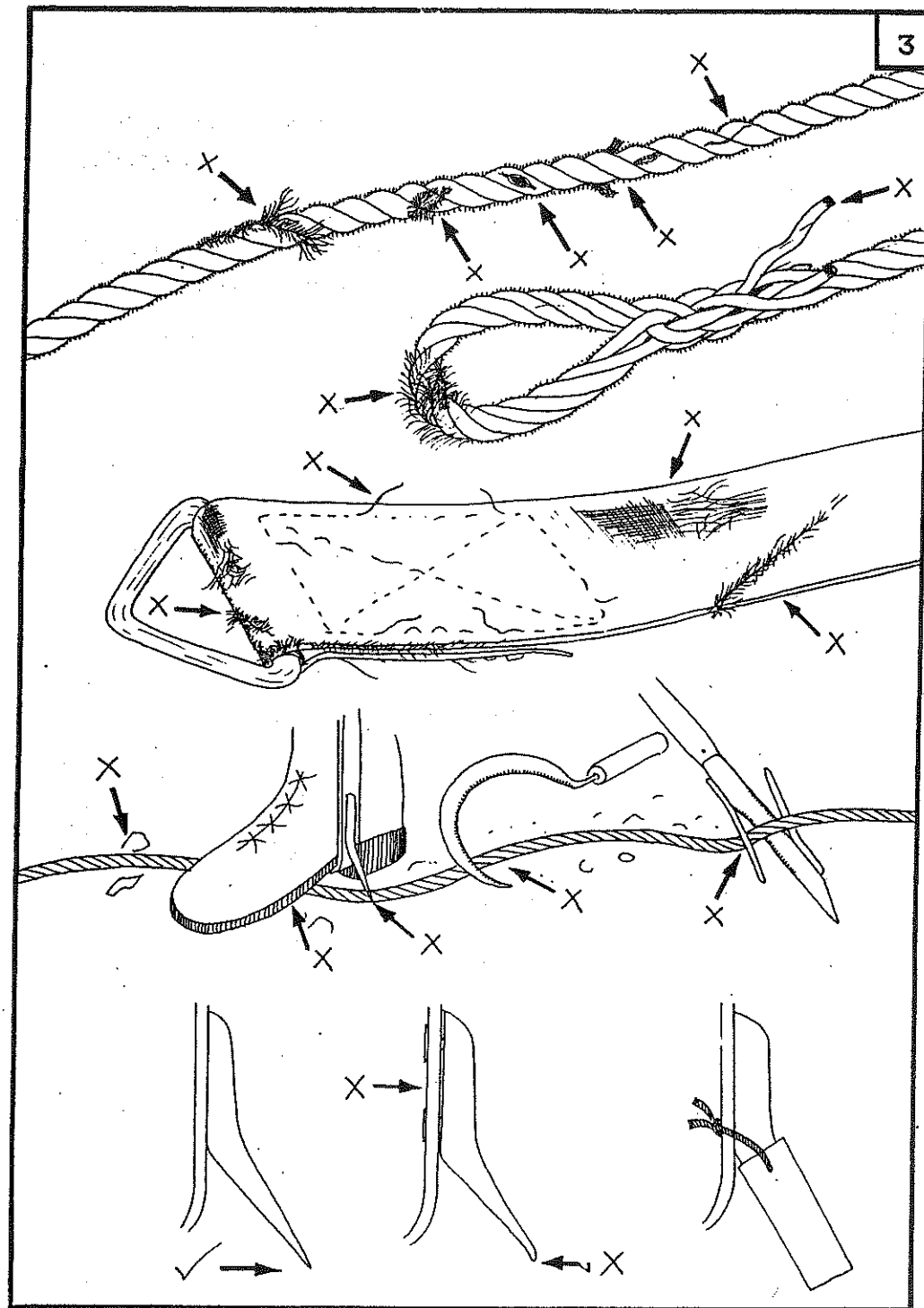
- CLIP (or carabiner). When you use the clip, insert the rope or ring by pushing the GATE inwards. When in use the GATE should be locked. The lock can either be of the manual type: screwgate, or the fast working type: twistlock. The carabiner should have a shape close to the D-shape shown.
- ROPE. This is made of 10-12 mm. diameter nylon, with 3 STRANDS. The ends of all ropes should be sealed off over a flame to stop the strands unravelling. The rope should be tightly spun and of good quality to be smooth to work with.
- SPURS. The PADS of the spur should be tight and comfortable, the long end should be in front. If the spur is adjustable, make the height as long as possible without causing discomfort under the knee. Keep the GAFFS properly sharpened and tightened during use. Always have protectors over the GAFFS when walking on the ground or transporting the spurs.
- SAFETY BELT. This should be fastened around the body above the hips.



Checking and care

NOTE! CHECK ALL EQUIPMENT CAREFULLY BEFORE USING IT.

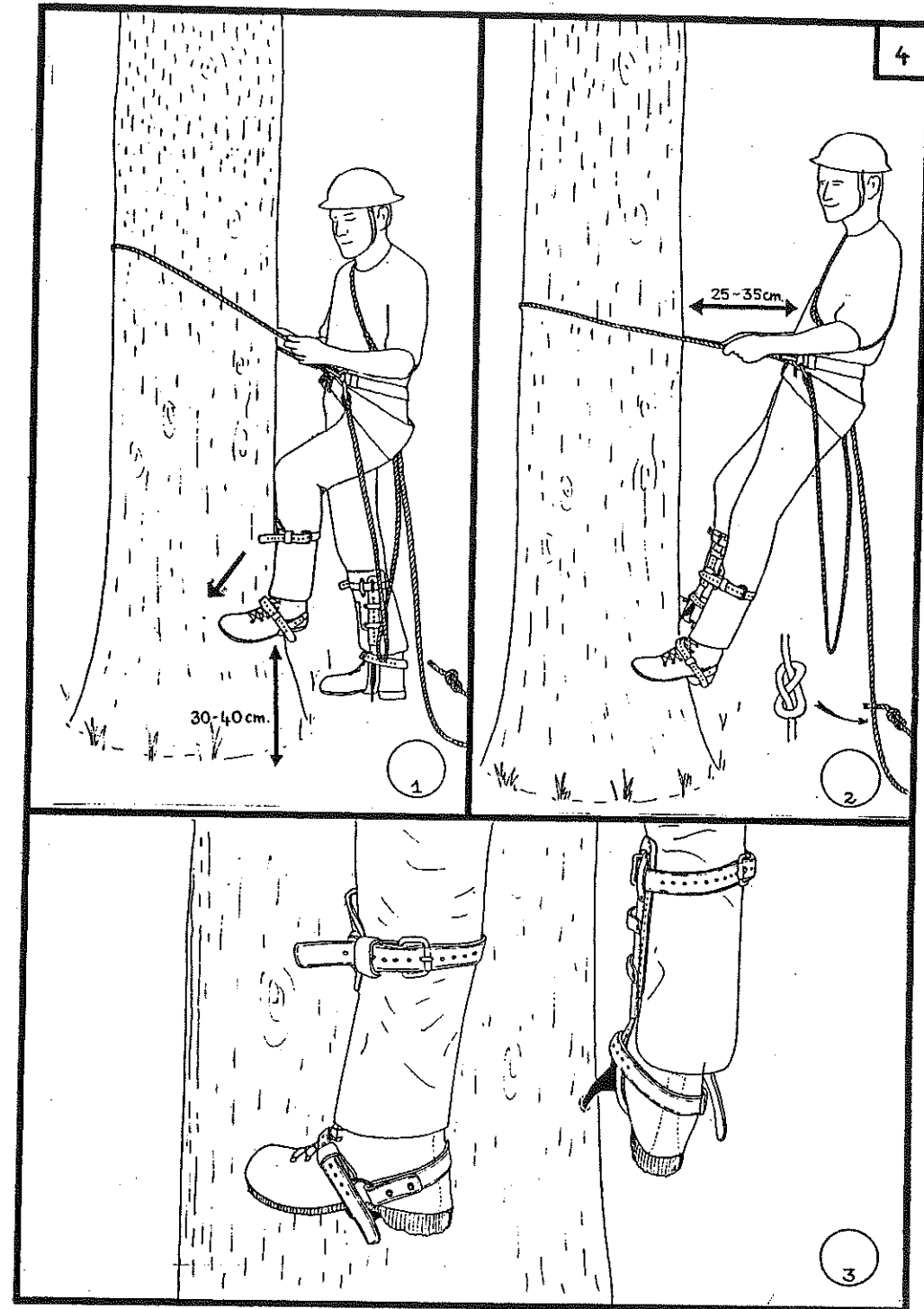
1. -Examine the whole length of each rope, and do not use it if any part shows a cut, burning, or excessive fraying.
-Do not use a safety belt that has loose stitchings, cuts, or shows excessive wear.
-Ensure that the gaffs are kept properly sharpened, and tightly fixed to the spur.
-Ensure that the scaling ladder sections are without bends or cracks and that the fastening straps or chains will hold the weight.
-Ensure that the screwgate on the clips will lock properly and that the gate springs back into position.
2. While using the equipment, take care not to drag the ropes along the ground, and do not step on them. In particular keep sharp tools well away from the ropes - also when climbing.
3. When you have finished with the equipment, examine it before storing. Clean as much dirt off as possible, and if the equipment is wet, make sure it is properly dried. Keep ropes, safety belts, straps and leather goods out of the sun and in a dry and well aerated place when not in use.
4. At the beginning of each season all equipment should be thoroughly examined while stretched with a load on. Be particularly aware of straps and leather goods which might have decayed and become tender during storage.



CLIMBING BY WAY OF THE BOLE

Using the gaffs

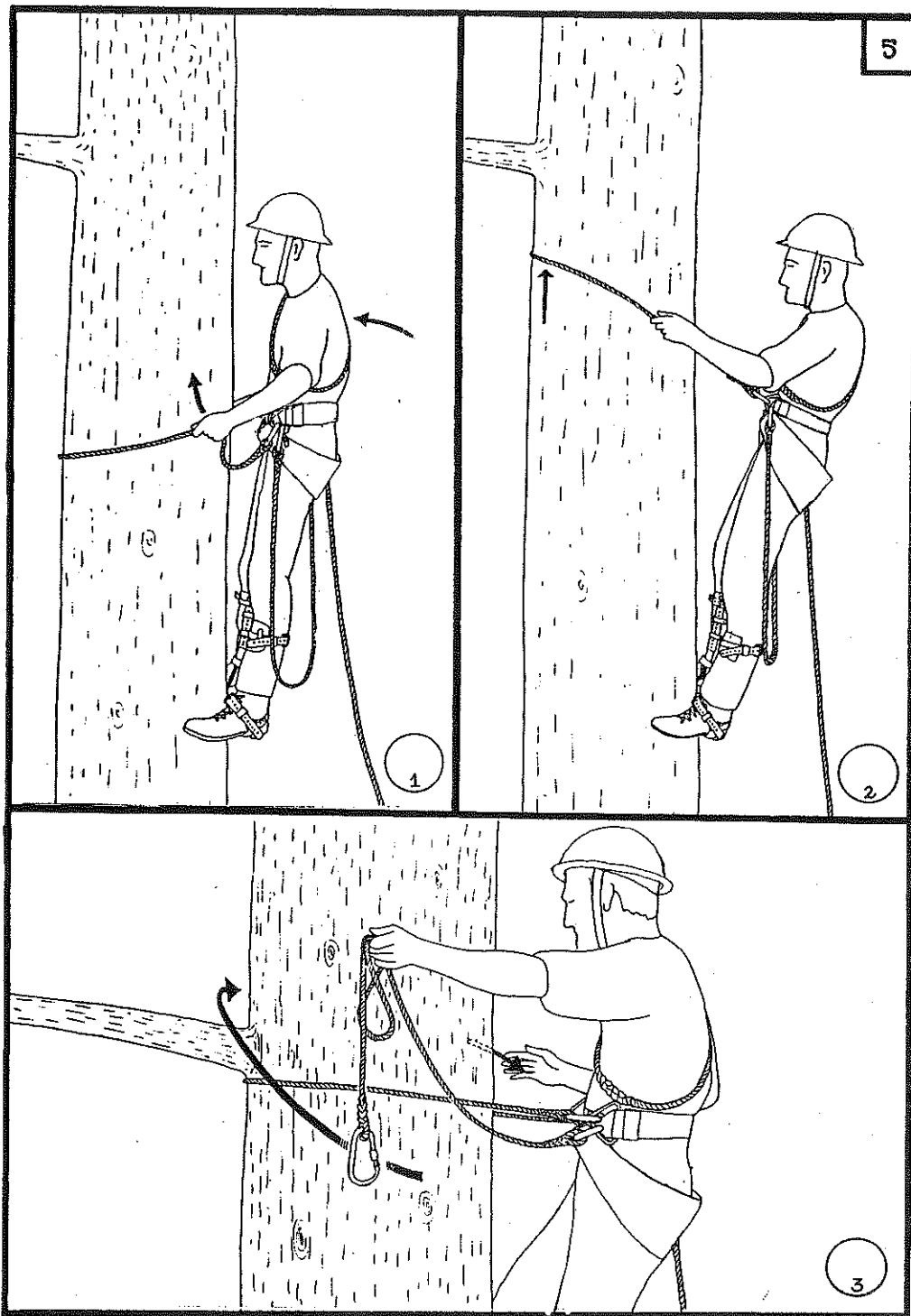
1. First of all, clear branches and debris around the tree so that the lifeline can run out freely, choose the best climbing route taking branching and tree slope into consideration and estimate the amount of equipment you will need and make a figure-eight stop-knot at the end of the lifeline.
2. Throw a short strop around the stem, and attach it with the clip. Then, lift a spur and jab it firmly into the bark. Do not make each step too high. About 30 - 40 cm is sufficient.
3. After placing the second spur at the same level check that the short strop has the right length. There should be 25 - 35 cm between the chest and the bole when you let the strop carry the weight of your straight body. If necessary adjust by using a strop of different length or the prussic- or bowline knot (see page 7, 24 and 25).
4. Keep the feet well apart to support you and so that if one foot slips, it will not injure the other leg. As you ascend, you may either place each spur higher than the other, or bring both spurs to the same level at every second step.



Handling the strops

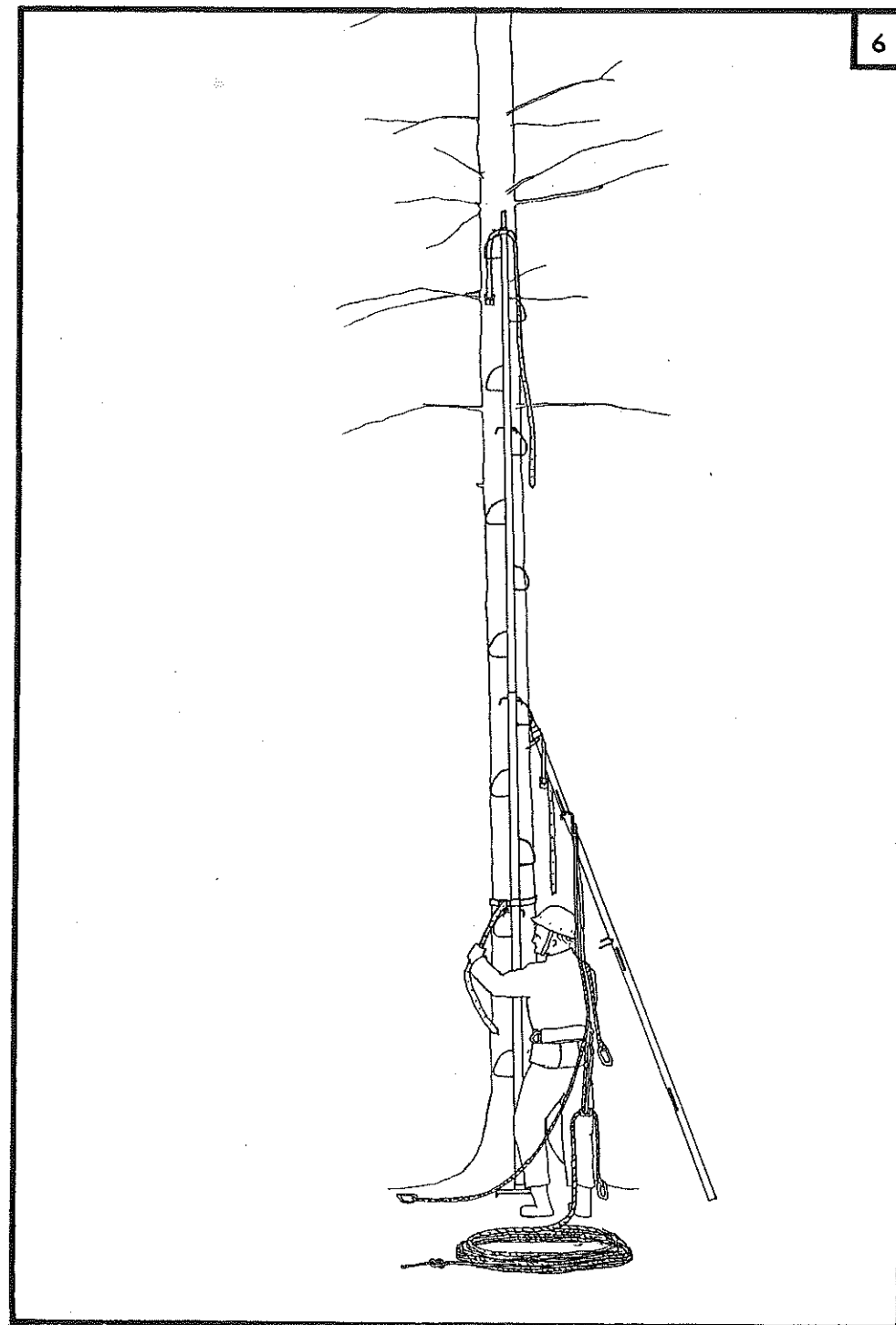
1. The strop is moved up after each pair of steps as follows:
Using the strop, pull in the body until you are balanced next to the stem.
2. Now flick the strop upwards as you lean outwards again. The strop will then stay up as it takes the weight of your body.
3. When a branch has to be passed, the second strop is thrown around the stem over the branch before the first strop is removed. If a strop becomes too long, place a shorter strop, or a strop shortened with the prussic- or bowline knot (see page 7, 24 and 25), around the stem before the long strop is removed.

NOTE! * You should at all times be safely secured with at least one strop around the stem.

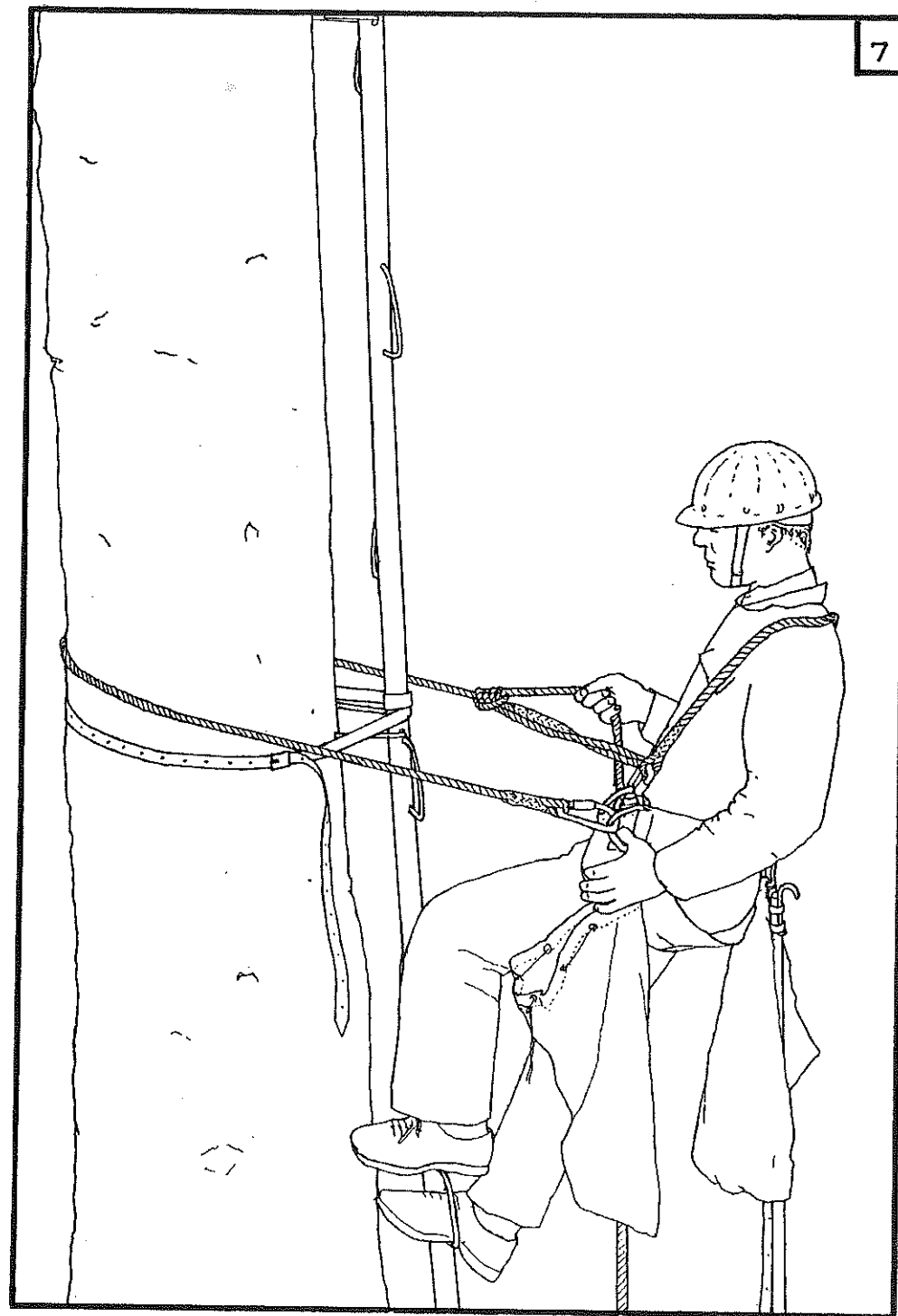


Scaling ladders

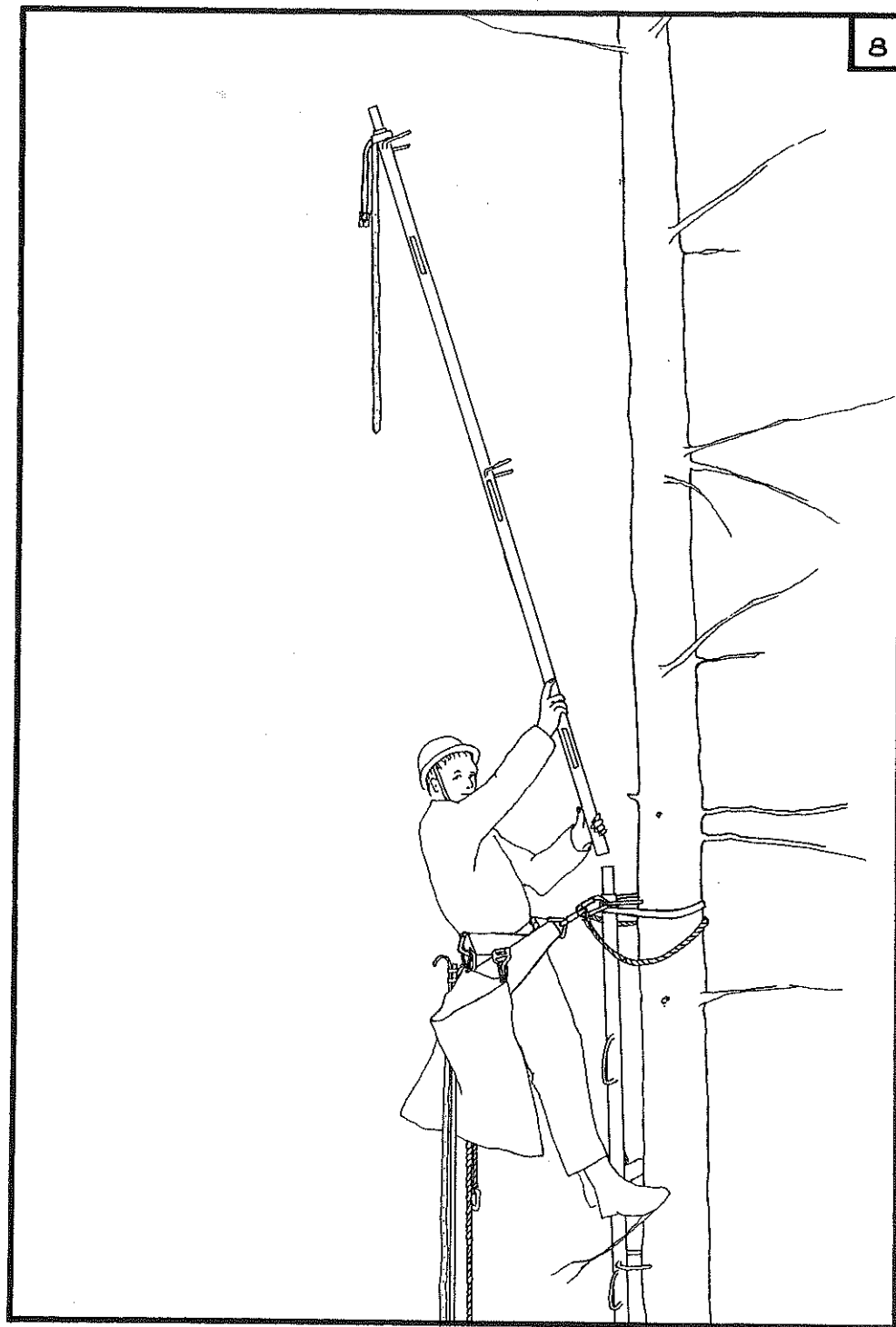
1. Clear branches and debris around the tree so that the lifeline can run out freely.
Choose the best climbing route taking branching and tree slope into consideration.
Estimate the number of scaling ladder sections, picking bags and strops needed.
Make a figure-eight stop-knot at the end of the lifeline.
2. Raise the first two sections of the ladder. The first section is fixed to the stem with a ladder strap at the middle of the section.



3. A strop must be used from the top of the first ladder section. If the strops are too short to reach round a thick stem, the lifeline and prussic knot may be used instead. The strop should lie over your arms while climbing up the ladder.
4. Fasten the hookstick/cutter and ladder sections you will need to your belt at the top of the first ladder section.



5. Each of the following ladder sections are fixed to the stem at the top ends during the onward climb.
6. When a new section is positioned it is appropriate to fix a carabiner from the saddle to the upper most rung of the section you are standing on.
Remember always to be secured with a strop.

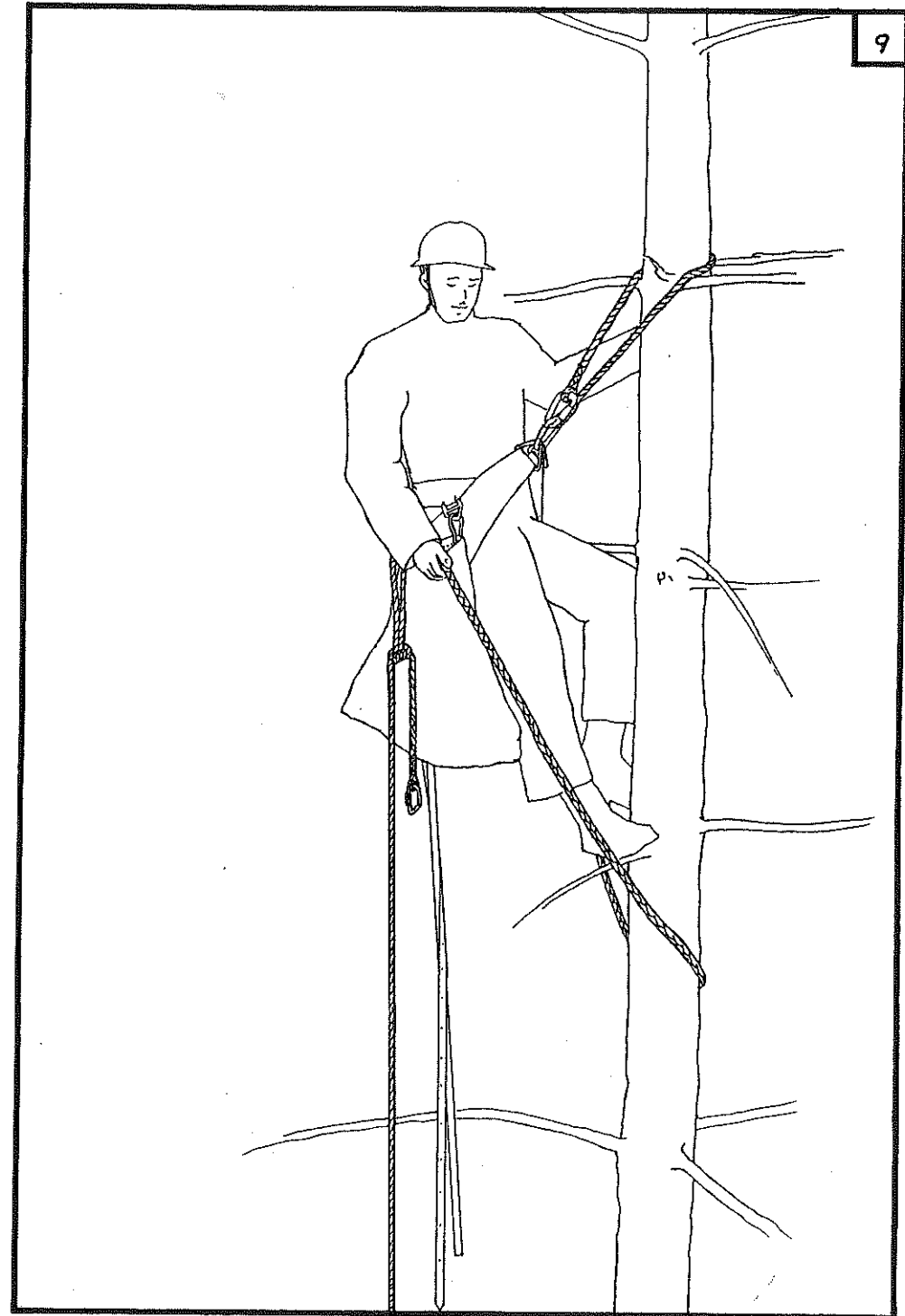


Climbing the branches to the anchor point

1. When live branches are reached, climbing in the crown is started. If the clean bole has been climbed with spurs, they can be taken off and left hanging on a branch.
2. Take care to climb in a straight line - allowing the lifeline to run freely between the branches.
3. Dry branches are broken off if possible, this is easier than changing the strops. When this is no longer possible, the second strop is taken into use changing as already described. Remember, you should always have at least one strop around the stem.

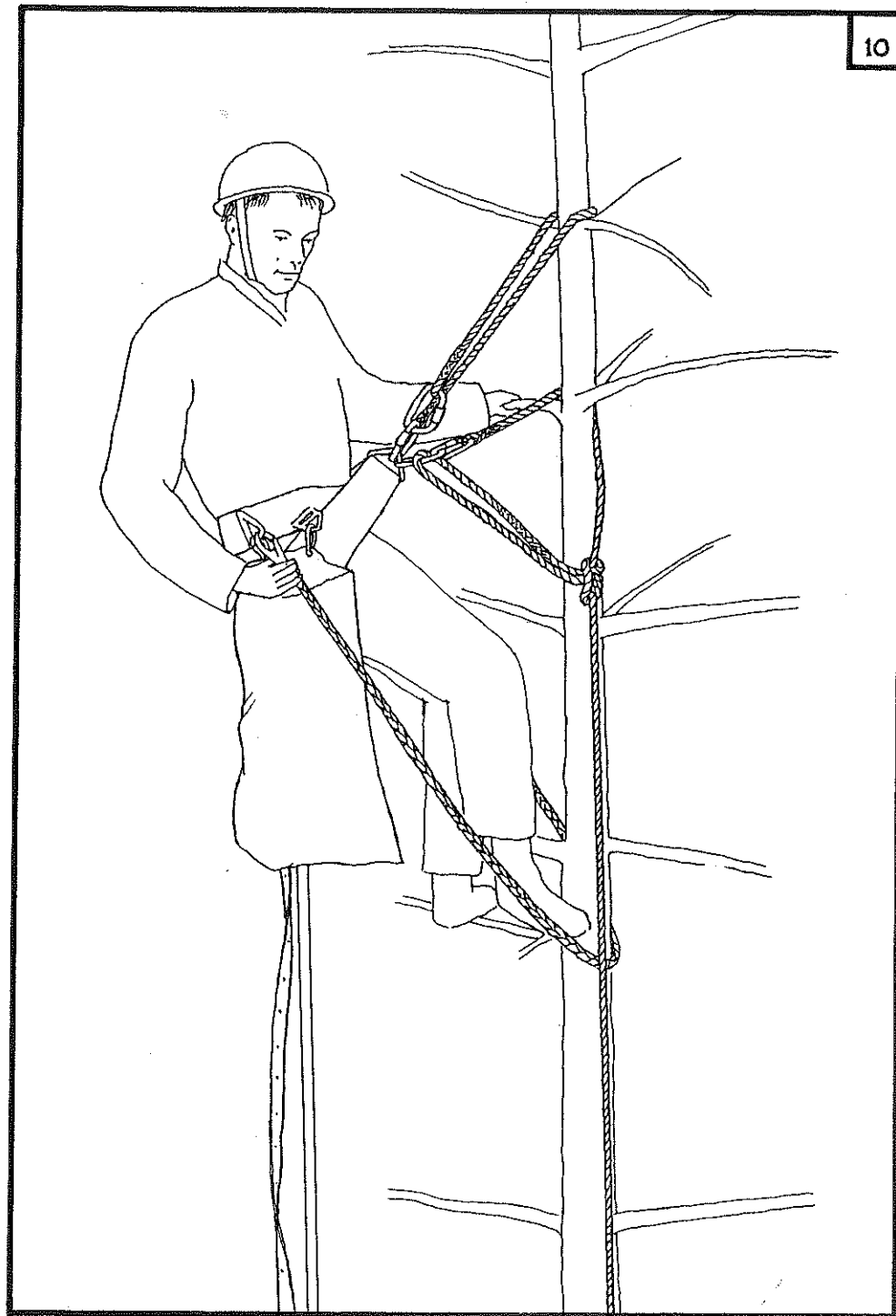
NOTE! * Make sure always to have an arm around the stem of the tree.

- * Never trust the branches.
- * Take your time while climbing.
- * Take care not to open the wrong carabiners.



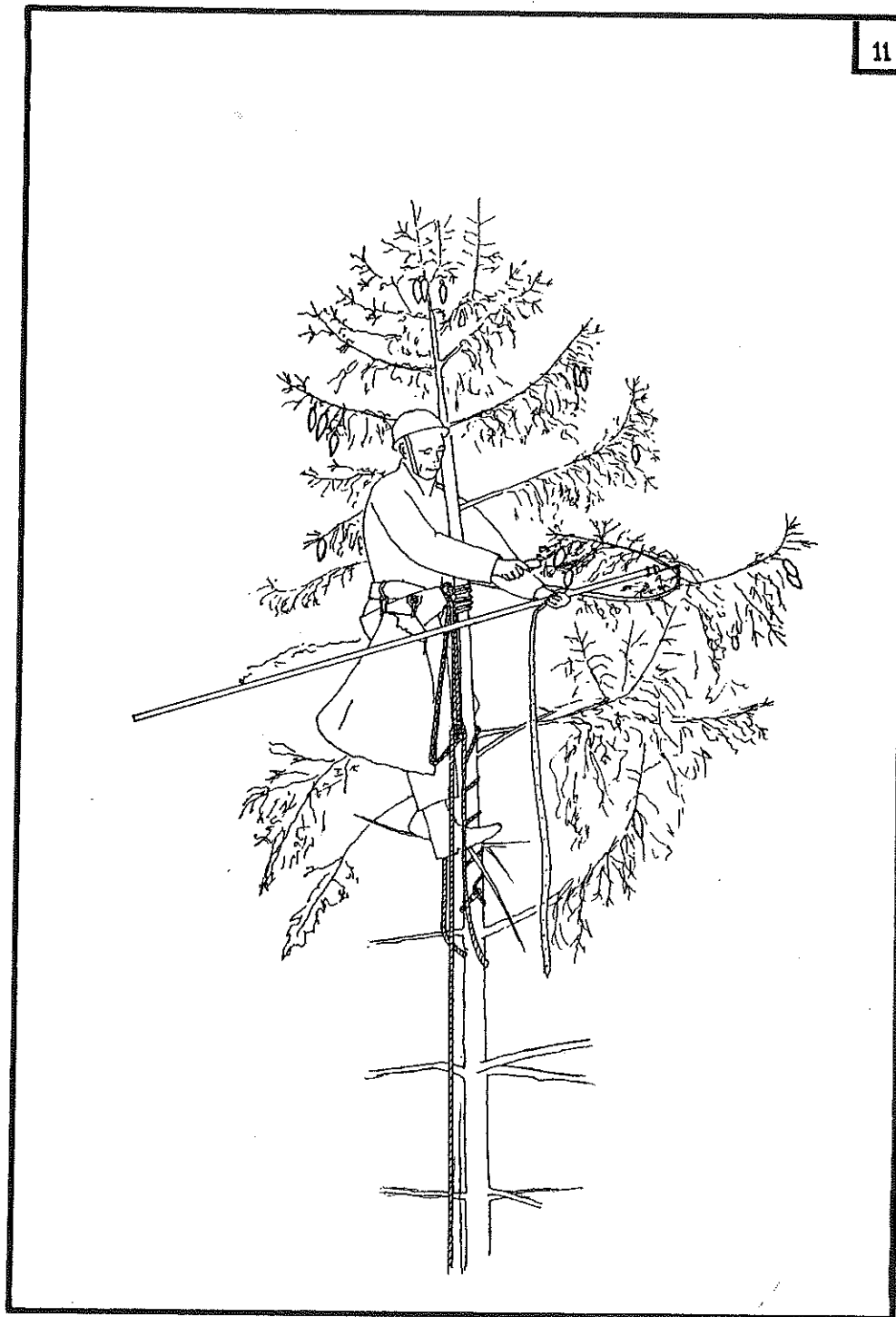
At the anchorpoint

1. When the anchor point is reached, the lifeline is put around the stem and only one branch (otherwise the rope friction will be too great and make onwards work difficult). The lifeline and prussic knot (see page 24) is then connected to the saddle with a carabiner.
2. The lifeline is fixed to this anchor point while the fruit is picked. It must therefore be solid enough to withstand the weight of a man with filled picking bags in the case of a fall.

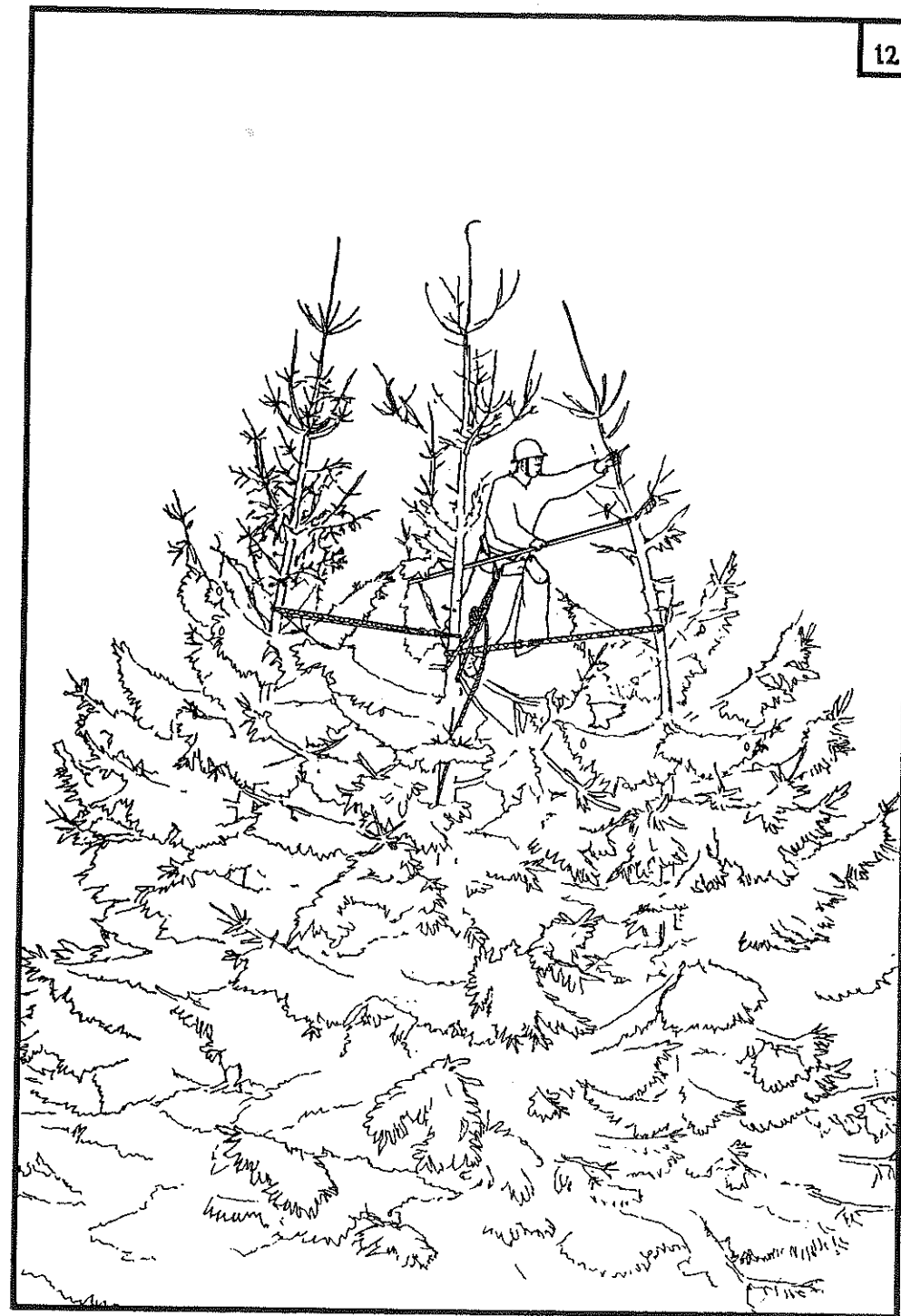


COLLECTION IN CONIFEROUS SPECIESAbove the anchor point

1. Start the fruit picking from the top. Long branches or nearby tree tops which are out of reach of your hand are pulled in with the hookstick and fixed with the strap. Both hands must be used for picking - it is therefore necessary to be fastened in a comfortable working position. Before dropping the filled picking bags to the ground, a shout of warning must be made.
2. If the upper branches are out of reach from the anchor point position, a higher climb may be necessary. You then keep the connection to the anchor point and secure yourself with the long strop which is twisted around the stem in order to shorten the falling distance - in the event of an accidental fall.
3. While picking in a thin and flexible tree top, the leg and/or a short strop should be put around the stem in order to get the weight as close to the stem as possible.

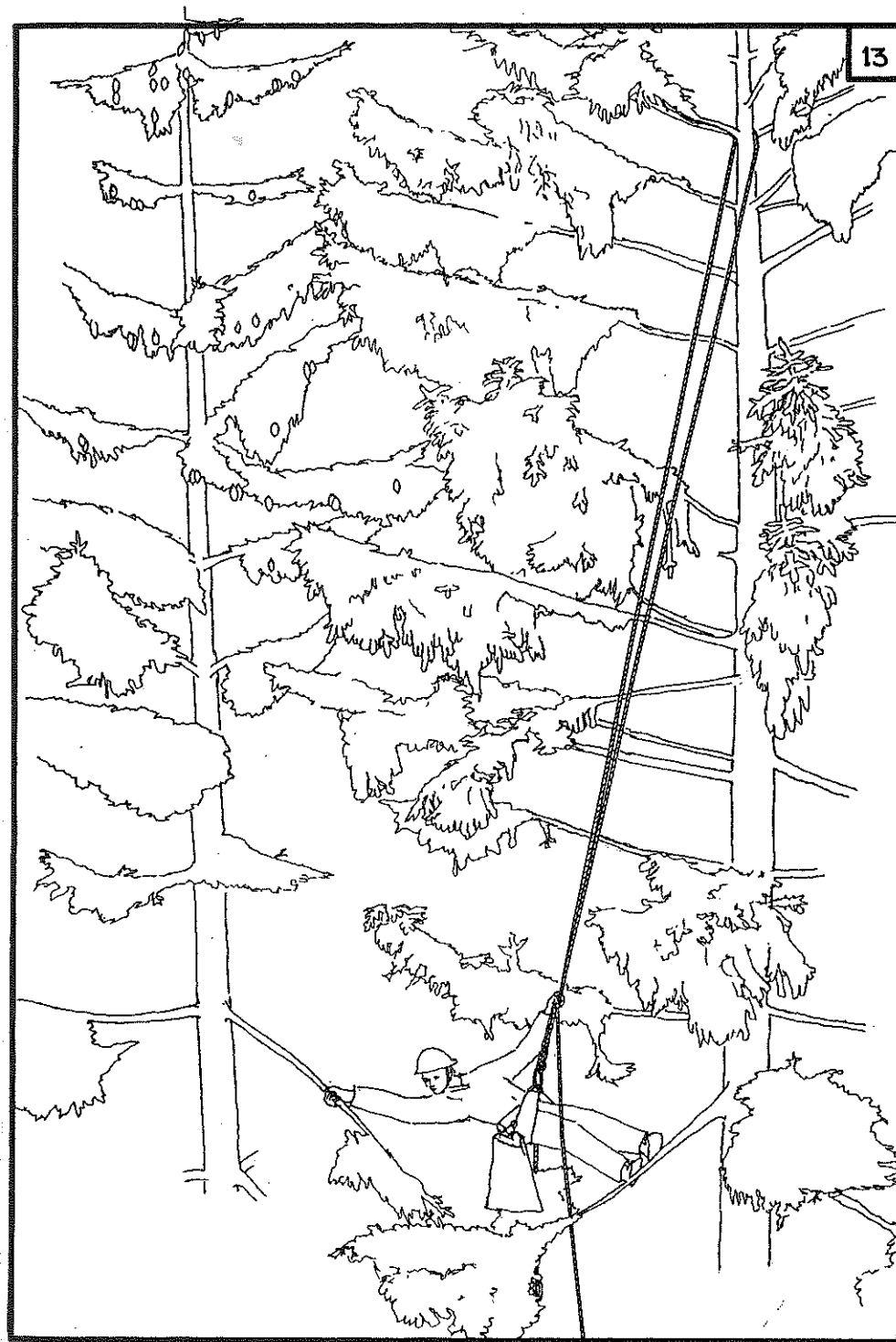


4. The tops of three or four very flexible trees may be tied together with strops. This support will make the picking easier.

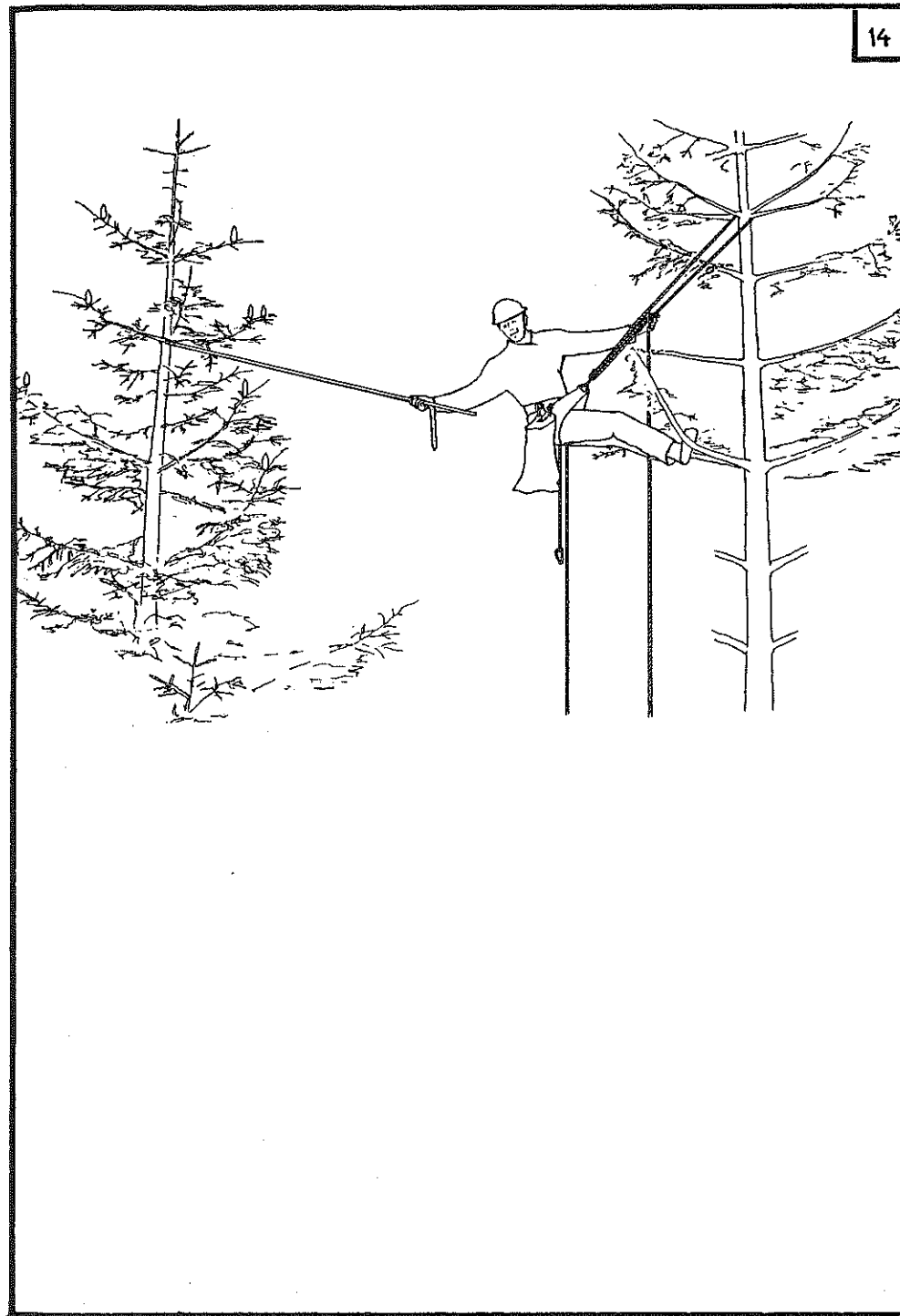


Going directly from one tree to the next

1. If the trees are very tall, hard to climb and standing close together, it may in some cases be possible to move directly into the crown of the next tree.
A variety of methods exists, mainly depending on the distance between the trees:
2. Method 1: You lower yourself down until the branches of the neighbouring tree B are within reach. You then pull yourself across and fasten a strop to the stem of tree B.



3. Method 2: You reach out with the hookstick from tree A and position it in a branch left in tree B. The stickstrap is fastened round the hand and you lower yourself onto the stem of tree B by loosening the prussic knot.



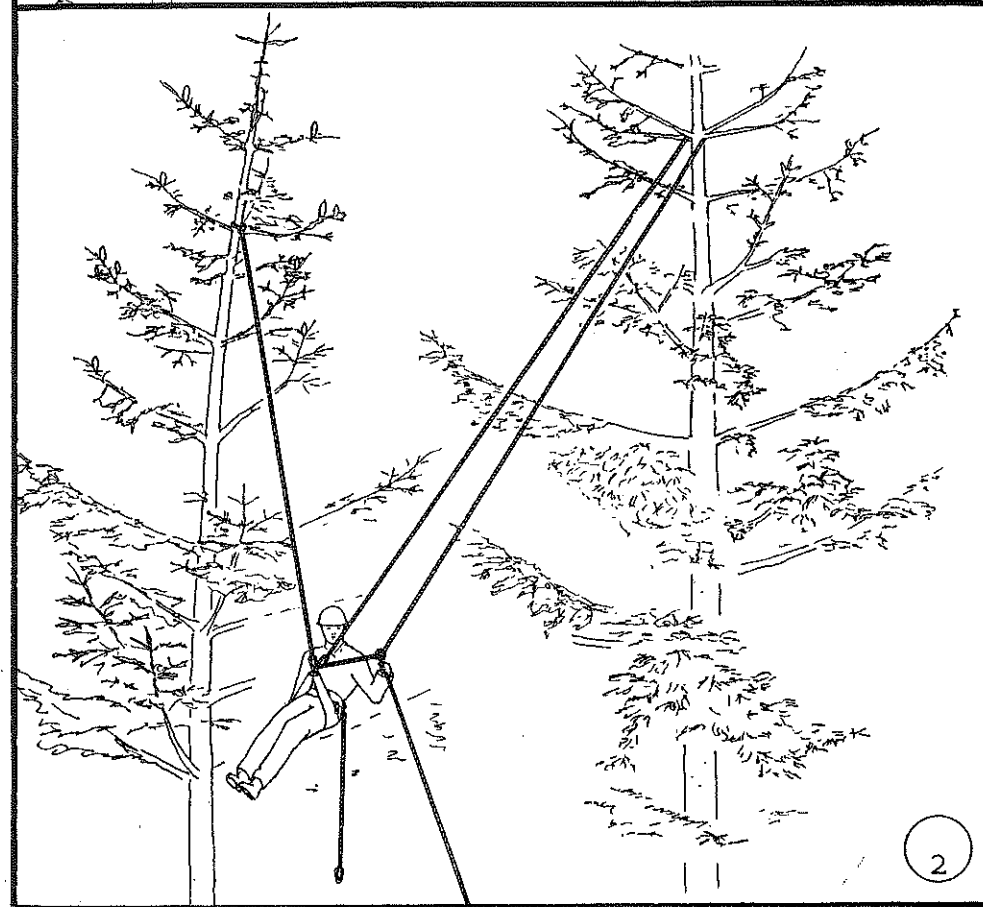
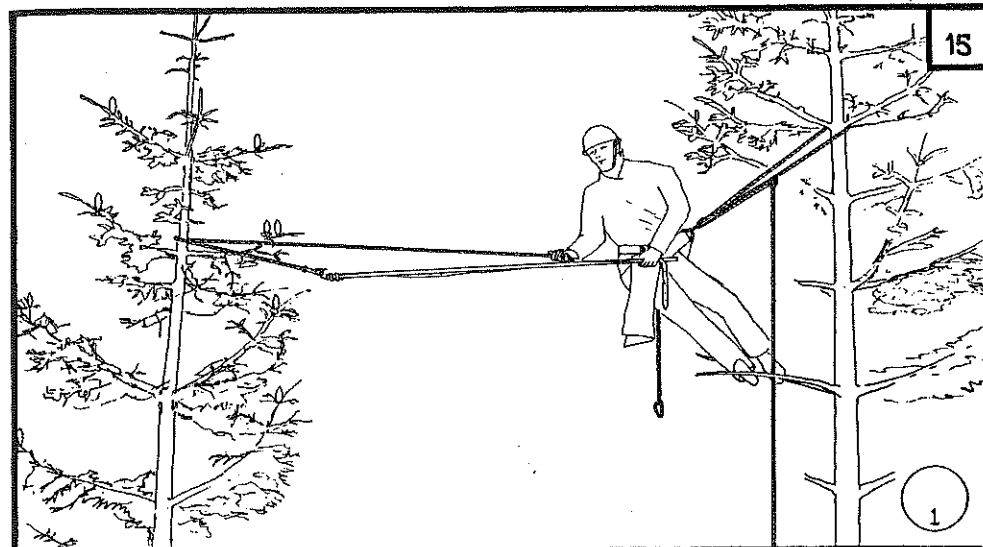
4. Method 3: Position the long strop around the stem of tree B using the hookstick. Pull back the end and connect it to the strop with a carabiner. Fix the other end to the saddle and then lower yourself down until you reach the stem of tree B.

NOTE! * Due to the strong side action imposed during the manoeuvre of "going from top to top" the anchor point must be chosen at a lower part of the stem with a larger diameter.

* As tree B cannot be checked for possible weaknesses beforehand, you must always be secured in two trees.

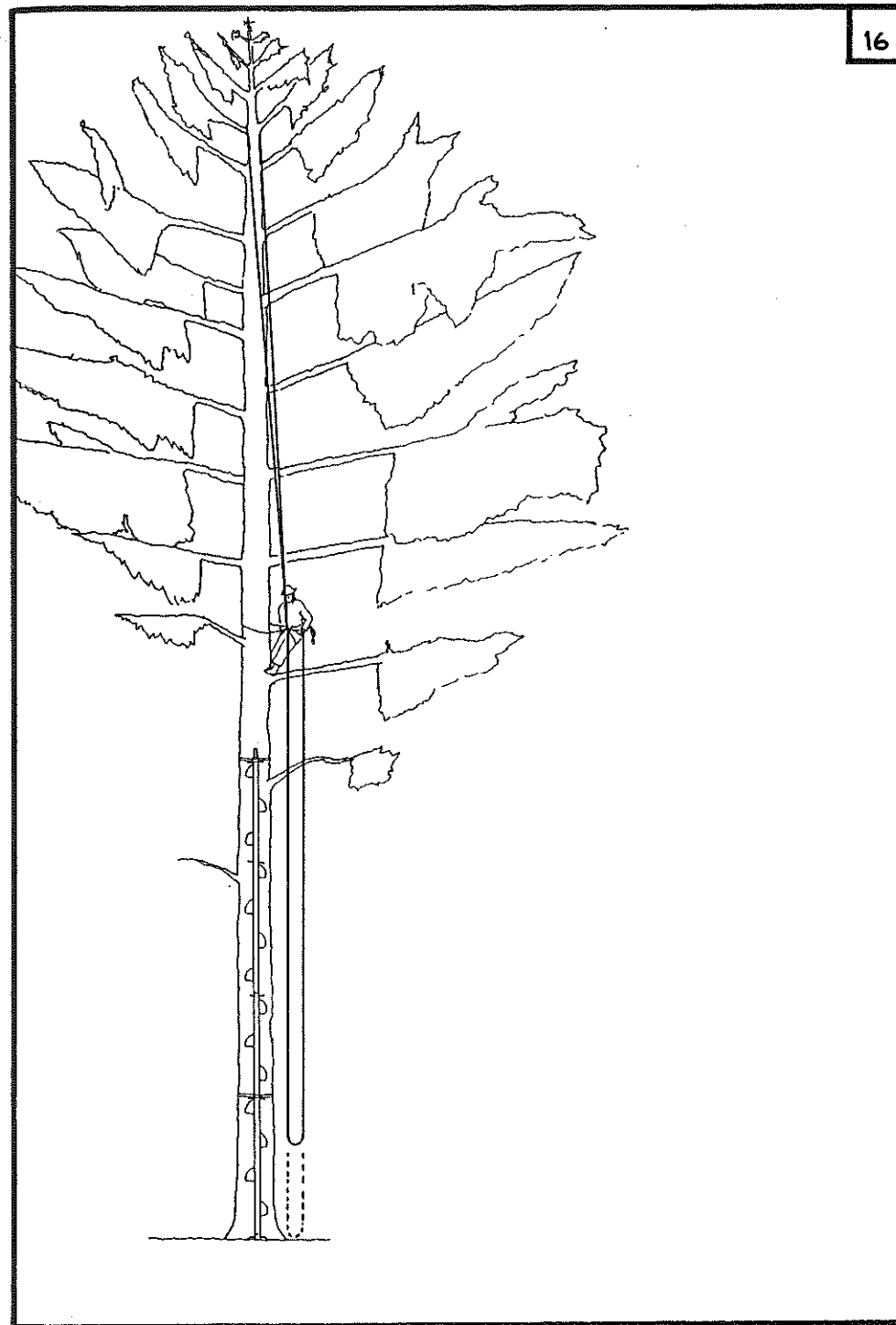
* Going directly from one tree to the next is naturally only done on a voluntary basis - but is considered perfectly safe when all safety measures are kept.

* Remember always to check the length of the lifeline. Half the length should be long enough to reach tree B.

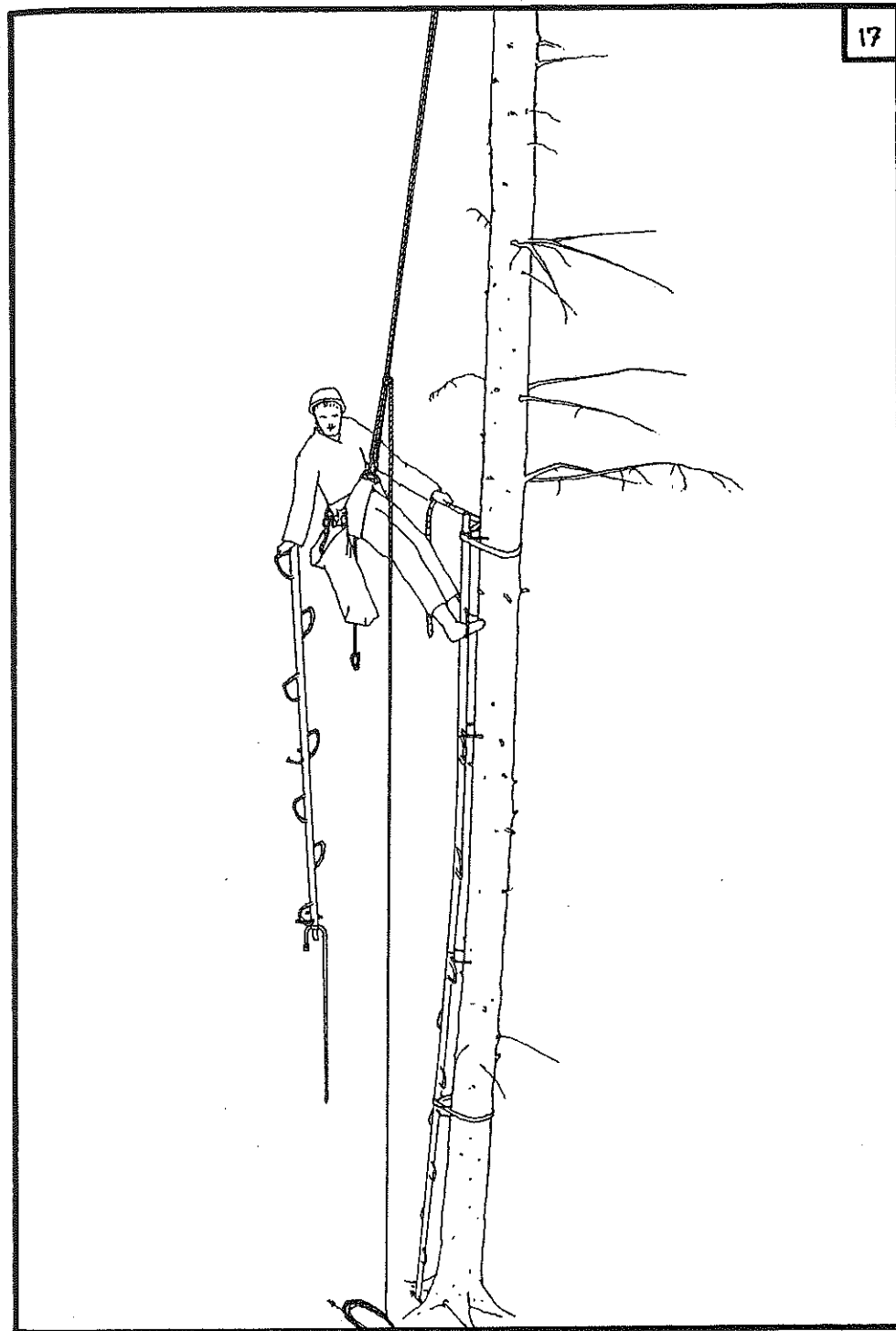


Descending on the lifeline

1. Before descent all carabiners and clips should be fixed so that they will not "catch" on the way down.
2. Be careful not to descend too fast as this may cause the prussic knot to melt.
3. When the second lowest live branches are reached, the rope length should be checked. If it is too short, it will be necessary to change the anchor point to the second lowest live branch.



4. The ladder sections are demounted on the way down. Some laddertypes will withstand being dropped down on the top end, other types will have to be carried down in the belt. If you drop the ladder down, take care not to hit stumps, stones and similar items that may damage the ladder.
5. Before pulling down the rope the figure eight stop knot must be loosened, otherwise it may get stuck in a branch or cleft - in which case it will be necessary to climb the tree again.



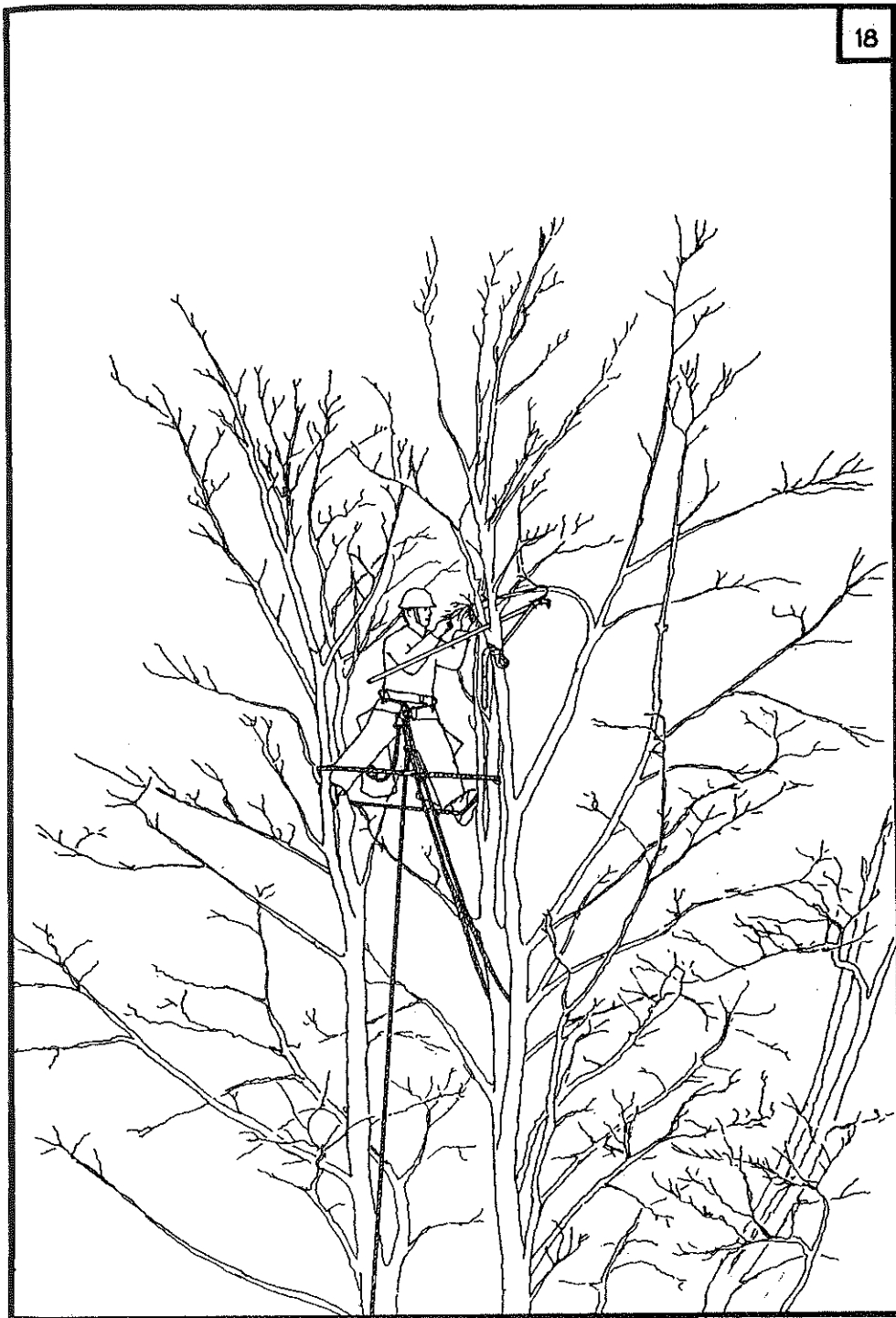
COLLECTION IN BROAD-LEAF SPECIES

Planning

1. It is difficult to set up methods for collection in broad-leaf species as the trees differ widely. Broad-leaf species may be physically exhausting to climb in.
2. The collection should be carried out systematically: Carefully plan your manoeuvres in advance. It may be useful to take along more than two strops for fastening branches or for standing on. The top of the crown is the most difficult part, so climb as high as possible and start there. In large trees each side of the crown is picked separately. If needed, more than one anchor point is used.

Collection above the anchor point

1. There are many forks and the branches are very flexible in the top of the crown. Stabilize the branches by tying two or more together with the strop and stand on it while working. You should be secured at one or two points as well as by the lifeline, which is secured to the anchor point. One strop may be fastened to the strop you use for standing on. In the case of a fall all the branches will have to break before you can fall with both strops.



Working at anchor-point level

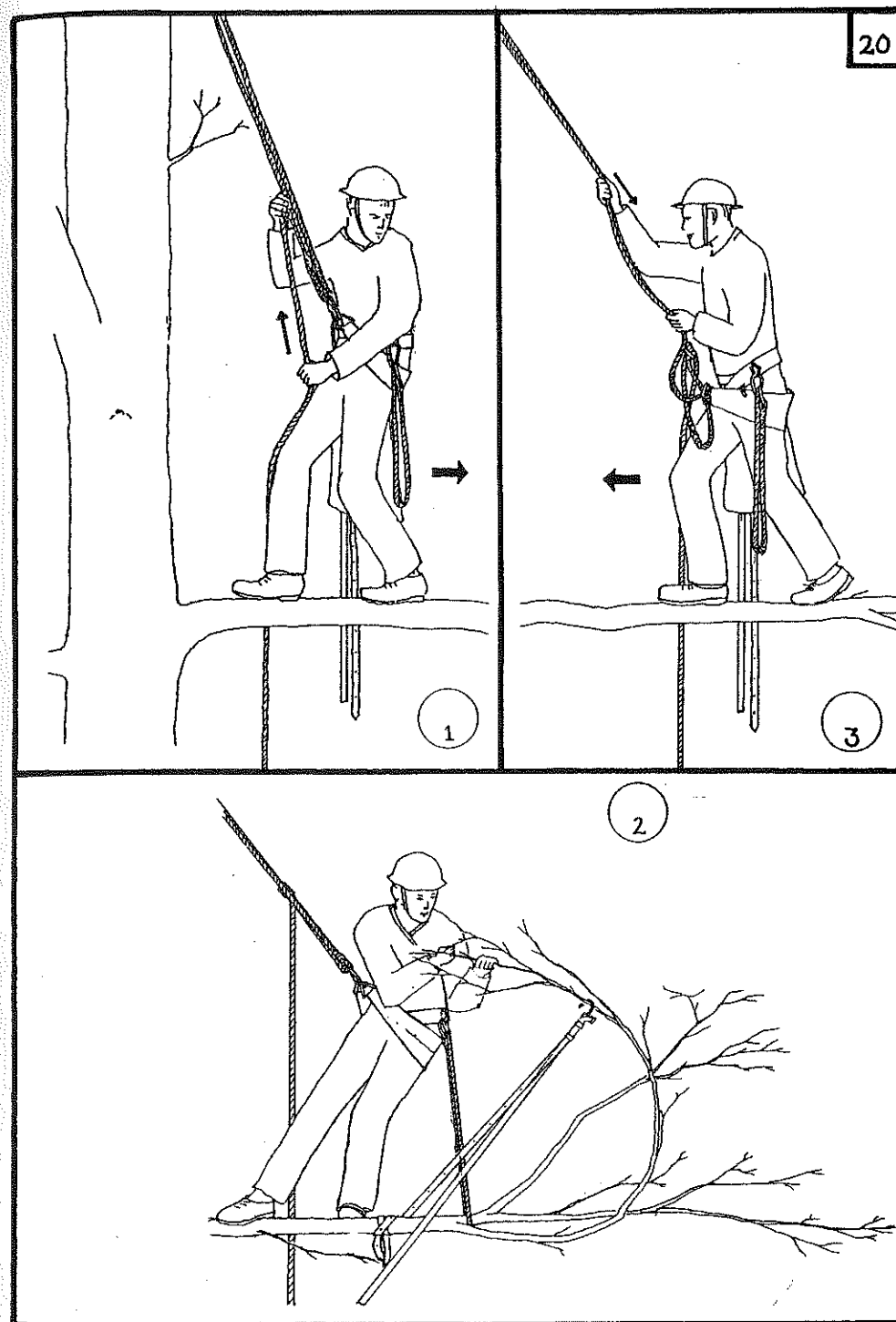
1. The branches are generally long and thin with many pointed forks at this level. If possible, fasten a branch to the stem using a strop. The taut strop or a filled picking bag may be used as a good foot support when working for prolonged periods in the same position. Secure yourself to the branch or strop and use the hookstick for pulling in all branches within reach.



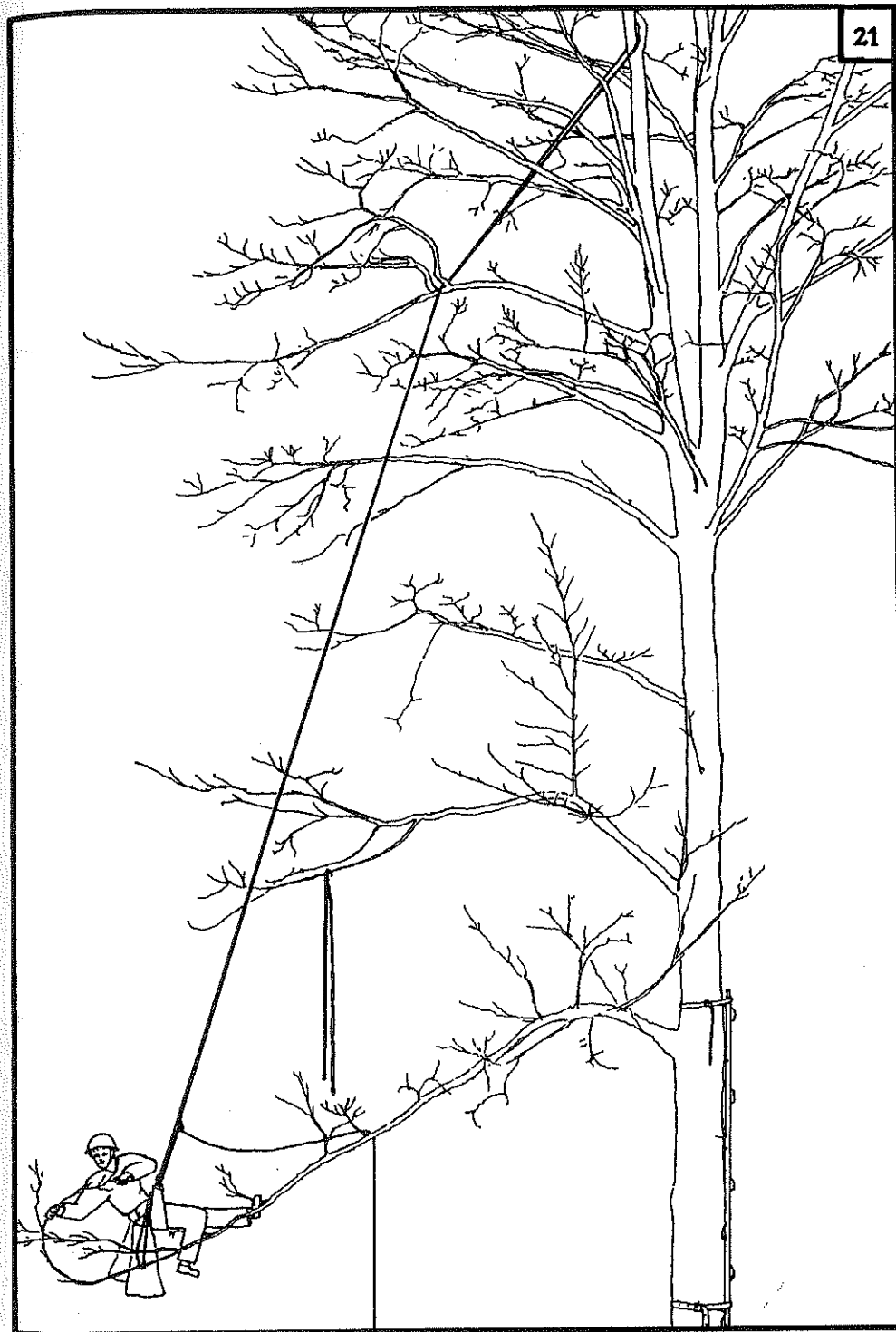
Working below anchor-point level

1. Walking out on a branch:

- (1) Stand upright on the branch and brace your body by keeping the lifeline taut. Walk out backwards while the lifeline is lengthened little by little by pulling on the prussic knot.
- (2) When the working position is reached, use one or two strops to act as braces for your body, the lifeline is kept taut in order to relieve the weight from the branch you are standing on. The ropes will stop you swinging about and allow you to use both hands for picking or to control a cutter.
- (3) You return along the branch by pulling both ends of the lifeline directly towards you to keep them taut. Once you are next to the stem, push the prussic knot back up the rope as far as it will go.

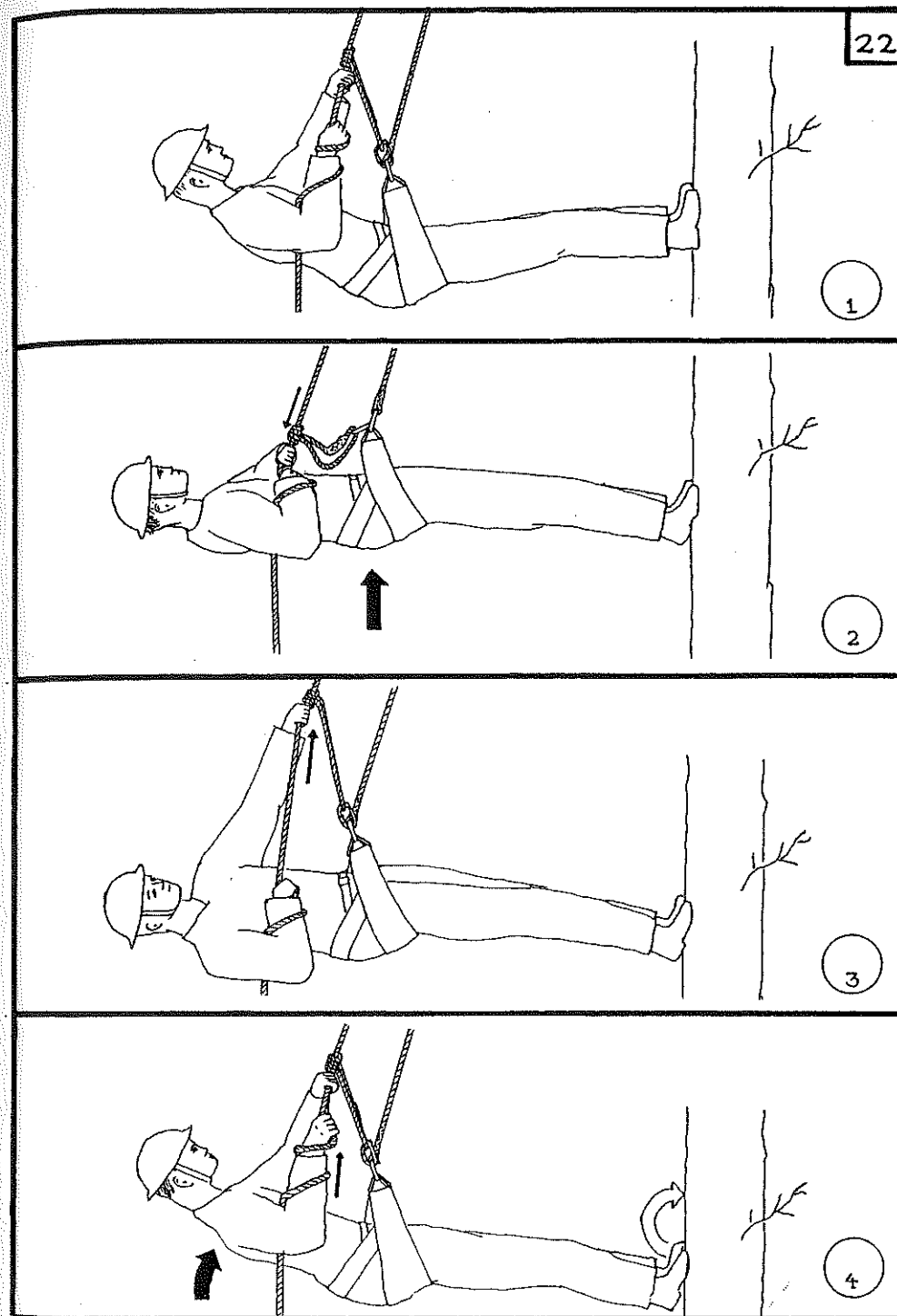


2. The slanting pull from the lifeline can be avoided if the climber lowers himself through a supporting fork of a branch. When picking is finished in one side of the crown, you move to the stem, secure yourself with a strop and pull the lifeline through anchor-point and fork. Afterwards, find a new anchorpoint to secure yourself to and carry on work from there.



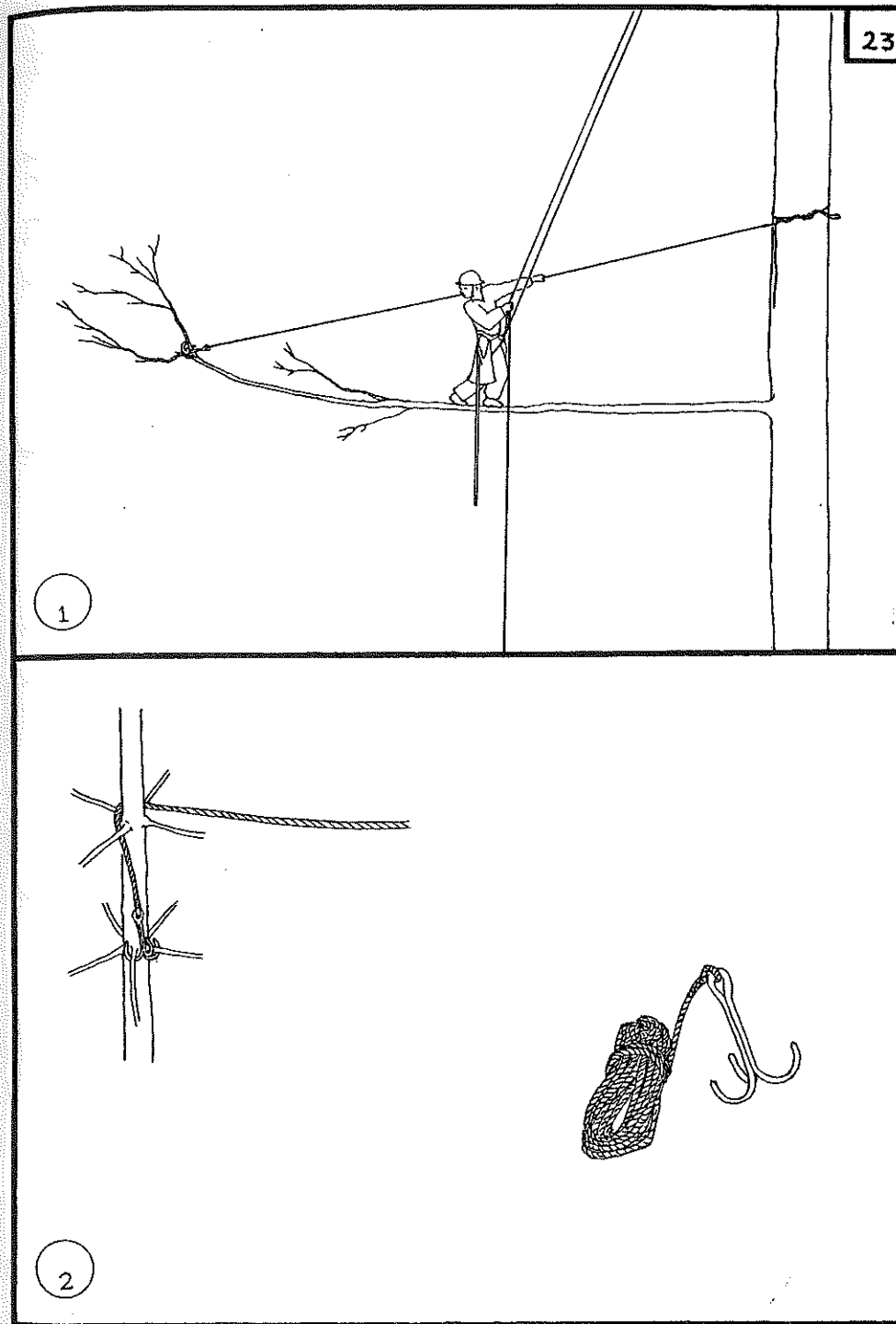
3. You may also walk up the stem if the lifeline already runs through the anchorpoint. This is particularly useful if there is no branches to climb on:

- (1) Stand horizontally with a straight body on the stem. Get a good grip on the lifeline with left hand just below the prussic knot.
- (2) Push your hips upwards, and at the same time pull down the end of the lifeline with the prussic knot.
- (3) Keep the end of the lifeline down with your right hand while you slide the prussic knot up with the left.
- (4) Lift the top of your body and get a new grip on the lifeline. Take one step up the stem.



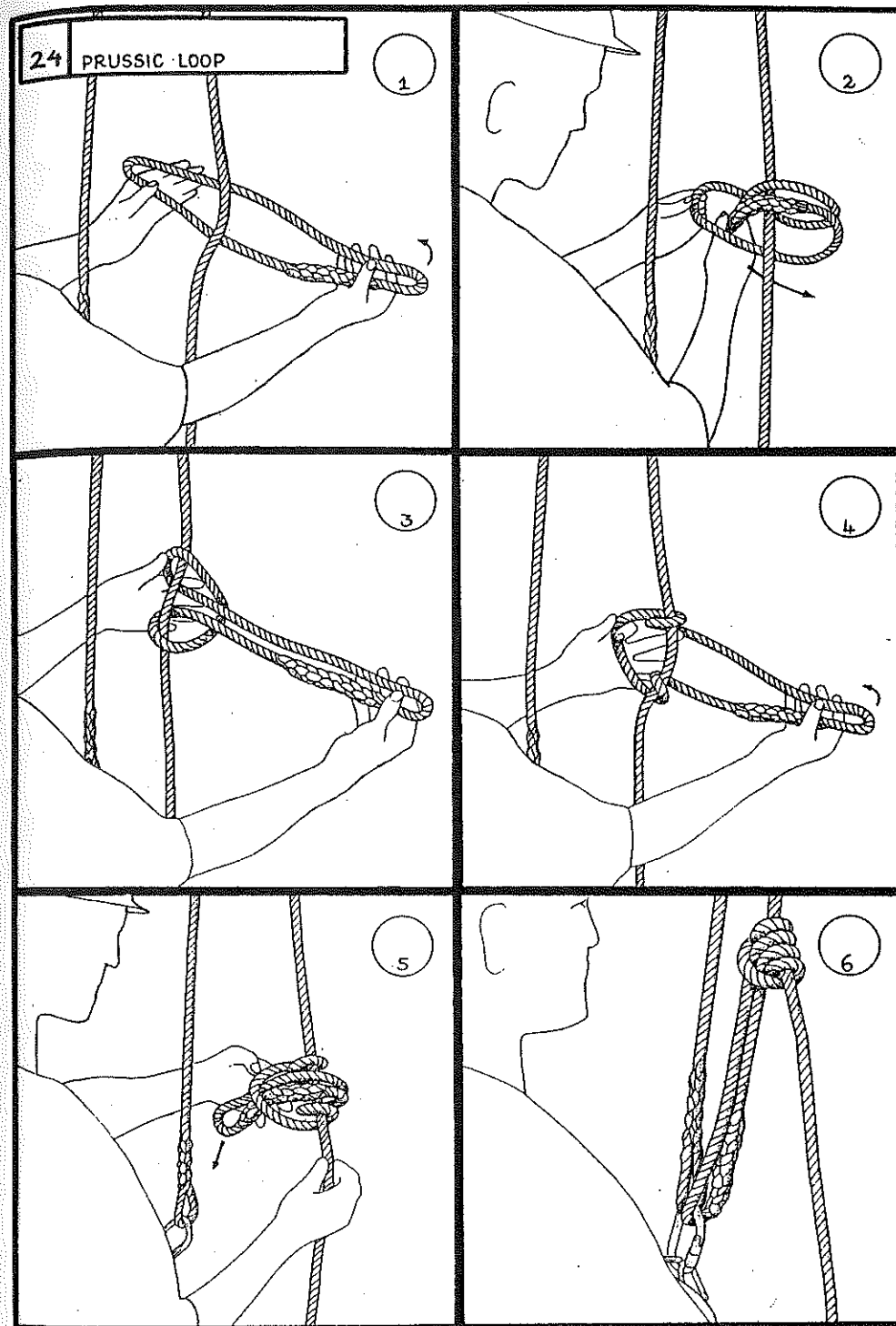
Use of the 3-hook

1. The 3-hook can be used as support when walking out on a branch. Be sure the hook has a safe grip in a sufficiently strong branch/cleft.
2. The 3-hook can also be used when going from tree to tree. The procedure is the same as used in method 3 (page 15), but in this case the trees are too far apart to reach tree B with the hookstick and long strop: Throw the 3-hook over a branch in tree B and lower it until it catches the branches underneath. The hook line is then fixed to the safety belt with a bowline knot (page 25) and you lower yourself down until you reach tree B. Remember to check the length of the lifeline; half the length should be enough to reach tree B.



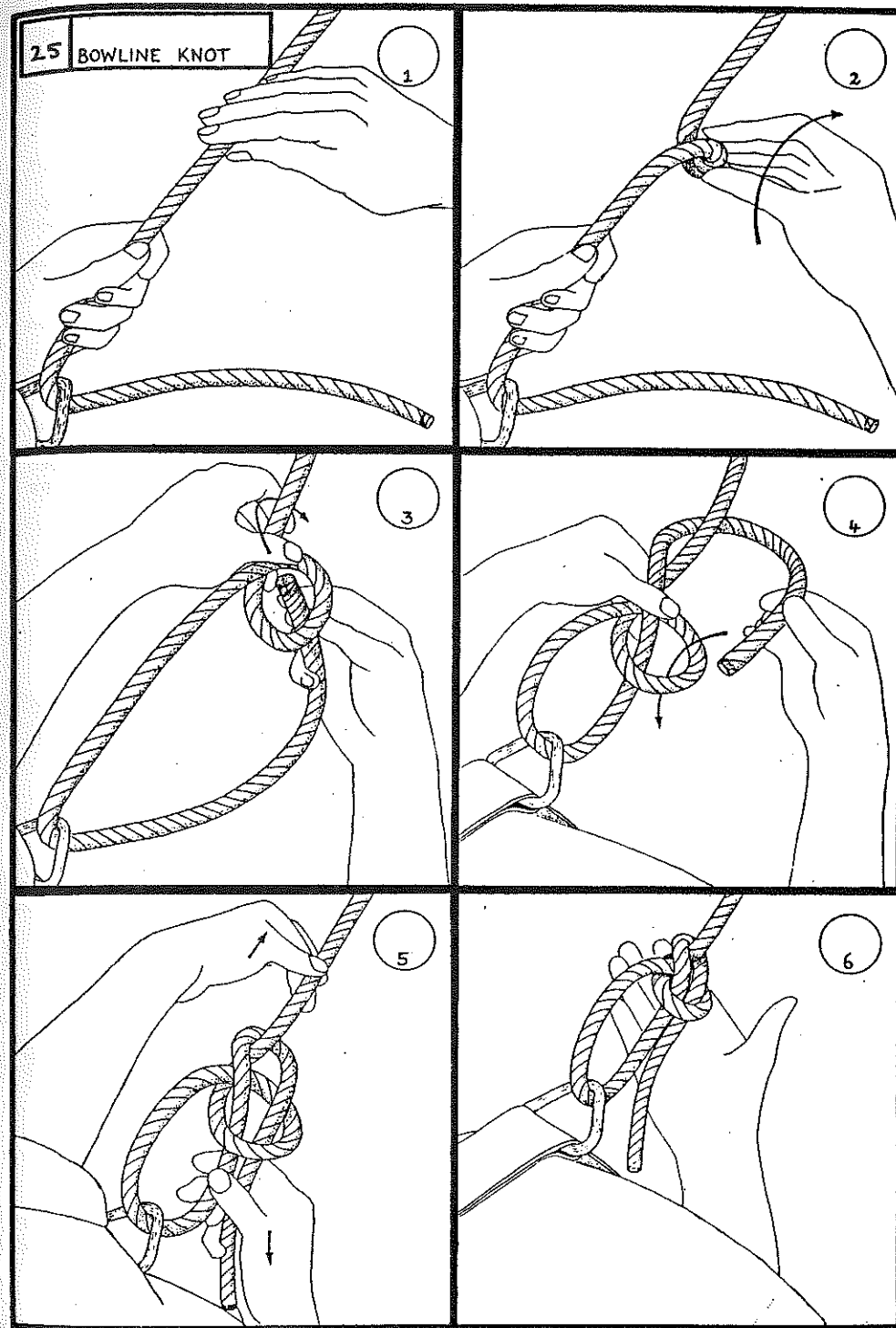
Prussic loop

- 1-4. At the anchor-point; attach the prussic loop to the lifeline as shown. Make sure that the splice is free of the knot and the clip.
5. Tighten the knot by pulling the turns together, and twisting them.
6. Attach the free end of the prussic loop to the clip. Test the knot to make sure it will hold when your weight is on it. Now remove the short strop.



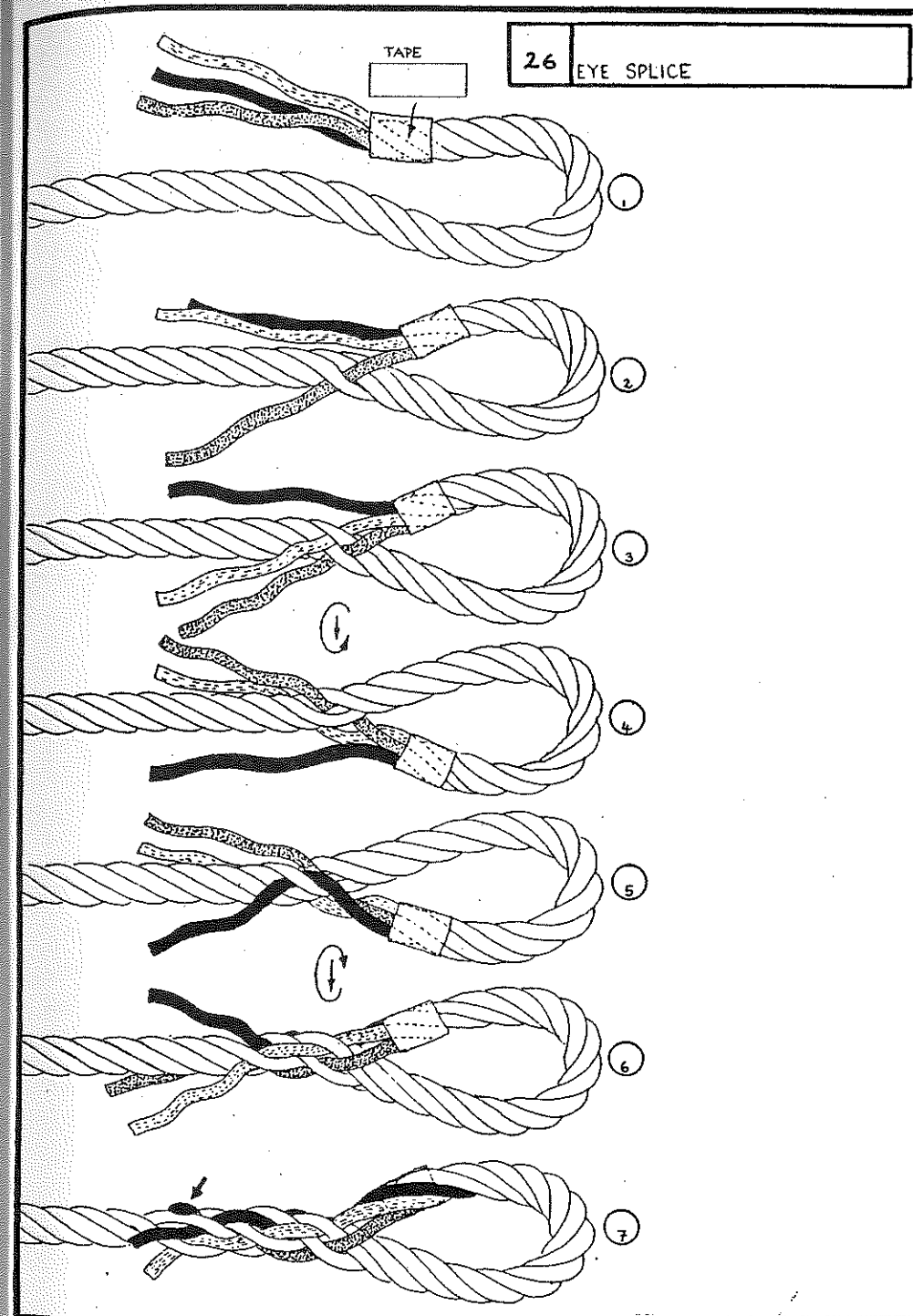
Bowline knot

1. The bowline knot is used for attaching strops and rope without eye-splice to D-rings and clips. It is easy to tie and untie, it does not run, and it is safe in use. You must know how to tie the knot quickly and effectively in any position. To remind yourself of the procedure, remember that: "The rabbit comes out of his burrow, round the tree, and then back down the burrow!". Make sure that the free end of the knot extends at least 25 cm.



Eye splice

1. Splicing is a very neat and strong way of attaching rope to a clip, but can only be used on rope with three strands. Unravel the strands for about 25 cm, and secure with sticky tape or a thread. Secure the end of the strands with tape or melting.
- 2-5. Open up the strands further back with a spike, and push the strands through as shown.
6. Insert each strand at least three times and keep them pulled tight.
7. Cut off the excess and carefully seal with a flame to finish off the strands. Do not burn the main rope. The eye splice should be made at both ends of the strops and at one end of the lifeline, the other end of the lifeline is sealed off with a flame to enable it to be pulled through a branchleft. If the rope is of a type that cannot be spliced, then bowline knots can be used.



Prussic splice

1-10. The prussic loop must be made of a 3 stranded nylon rope of the same diameter as the lifeline, and joined with a splice as shown.

Before starting the splice twist the rope about $\frac{2}{3}$ of a turn as the splicing will untwist the rope somewhat.

You should overlap each side of the splice by at least 3 insertions. Pull the strands through tightly and seal with a flame in the same way as the eye splice.

NOTE! Do not use this splice for joining ropes into a lifeline. It would catch in the branches and not run through the prussic knot.

27 PRUSSIC SPLICE

