THE knot BIBLE

A PRACTICAL GUIDE TO THE 200 MOST USEFUL NAUTICAL KNOTS

THE knot BIBLE

THE COMPLETE GUIDE TO KNOTS AND THEIR USES

NIC COMPTON

ADLARD COLES NAUTICAL
Bloomsbury Publishing Plc
www.adlardcoles.com

Contents

Welcome to knots

What is it about knots? How can such an apparently simple occupation as twisting bits of string into preconceived patterns be so endlessly satisfying and have such wide-ranging appeal? Knots have intrigued writers and artists since ancient times, and even Leonardo da Vinci was not adverse to doodling the occasional turk's head when the fancy took him. So, if you like to tie knots, you're in good company! The knots in this book range from the practical to the decorative, the curious and the downright brilliant.

Hitches
It's the biggest section in the book, with 47 knots for tying a line to an object, ranging from old timers developed during the Age of Sail to ingenious new knots devised in recent years.

Bends
More than 30 ways of tying two lines together, including a neat option for slippery high-modulus ropes such as Dyneema® and Spectra® (page 101). Needless to say, you won't find a reef knot here (because it's not a bend!).

Loops
There's something for everyone in this section: Spanish, Eskimo, double, triple, sliding and locking, not to mention handcuffs and a couple of crazy braided loops. Are the days of the bowline's rule numbered? Find out on page 112.

Knots
Featured knots include everything from stoppers to heaving line weights (including the monkey's fist and paw), a rope tackle and a couple of bottle slings. Plus that much-misinterpreted reef knot.

Lashings
Need to set up a jury rig or build a shelter? These are the oft-neglected but essential building knots for creating all sorts of interesting structures.

Coils
They say cleanliness is next to godliness, so best keep your ropes tidy! We also discuss the pros and cons of cheesing rope.

Decorative knots
There are mats, turk's heads and lanyards, plus some of the most complicated knots in the book. Take a deep breath, and follow our specially extended step-by-step sequences.

Whippings and seizings
There is more essential rope care information here, plus a couple of decorative whippings which rarely see the light of day.

Splices
These include a few old standards, a couple of obscure ones from yesteryear, plus some bang up-to-date splices from the high-modulus camp. And just wait until you see our soft shackle. It's the next must-have item for every sailor!

IMPORTANT NOTE

Each knot is accompanied by a Knot Score box which gives a score, ranging from 1–5, for Strength, Security, Difficulty Tying, Difficulty Untying and Usefulness. The scores are solely based on observation and experience, and not on scientific testing. They should not be taken as definitive, nor should they be used as the basis for tying the knots for any critical purpose. In any case, results will vary depending on the type and condition of the cordage being used, as well as the particular circumstances in which the knots are tied (eg size of load, whether the line is wet or dry, etc). Readers are advised to test the knots for themselves and reach their own conclusion before using them for any critical activity.

For more information about the knot score boxes, see page 23.

"To me the simple act of tying a knot is an adventure in unlimited space. A bit of string affords a dimensional latitude that is unique among the entities. For an uncomplicated strand is a palpable object that, for all practical purposes, possesses one dimension only. If we move a single strand in a plane, interlacing it at will, actual objects of beauty and of utility can result in what is practically two dimensions; and if we choose to direct our strand out of this one plane, another dimension is added which provides opportunity for an excursion that is limited only by the scope of our own imagery and the length of the ropemaker's coil. What could be more wonderful than that?"

Clifford Ashley, The Ashley Book of Knots

The basics

1

History of Knots

Knots have existed for as long as there has been rope to tie them with, for a piece of rope is pretty useless without a knot to fasten it onto something. And rope was used for all sorts of things, from carrying loads, snaring and tethering animals, to building houses. It was also useful in wartime to trap, tie and even execute enemies. And a piece of stretchy animal's intestine tied to a stick made a wonderful slingshot. But all of them needed knots.

Above **The Tall Ships races have helped keep alive the art of sailing square-riggers – and tying complicated knots.**

In the beginning

Not surprisingly, there's evidence of knot-tying all over the world. The earliest objects thought to require cordage – and therefore knots – are two pendants found at the Repolusthöhle in Austria, which are 300,000 years old. We know the Ancient Egyptians were familiar with knots, as a length of twisted twine was found in Tutankhamun's tomb (c.1620 BC). The Nootka and Clayoquot tribes of the west coast of America used cedar to make whaling lines 100–125mm (4–5in) thick and up to 360m (1,200ft) long. They also made lanyards for their harpoons out of whale sinews, twisted into three-strand rope, and tied with knots.

Both the Ancient Greeks and the Romans used knots extensively. In fact, so far ahead of their time were the Ancient Greeks that, back in the 4th century BC, Oribasius published a range of 18 knots and slings intended specifically for surgical use – surely the first such specialist knot list.

But perhaps the most imaginative use of knots were the 'number records' developed by the Incas before colonisation. Using a decimal system, numbers were recorded in lengths of cord, called *quipus*, using knots instead of numerals. Thus three knots (or a triple knot) in the 'unit' position represented three; three knots in the 'ten' position represented 30; three knots in the 'hundred' position represented 300, and so forth. A single *quipu* might hold up to 2,000 cords, each one colour-coded to indicate what was being counted, eg green for cattle, white for sheep, etc. *Quipus* were used in place of written records and were regarded as legal documents by the local government.

Heydays of knotting

Knot-tying really developed into an art form in the 18th century, starting with the Age of Discovery and the explosion in world trade that followed. As ships ventured increasingly further afield to deliver cargo, lengthy passages at sea, often lasting several months, meant that sailors had time on their hands. Most were illiterate and could not seek refuge in books, even when those were available.

Above **The Incas used knots for counting several hundred years before the Chinese invented the abacus.**

Instead, they turned to 'the arts': model-making, scrimshaw (carving whalebones), tattooing, sewing, knitting, crochet, basket-weaving and even hat-making were all practised by sailors desperate to alleviate the monotony of a long passage. But the pastime of choice for most was knot-tying.

Indeed, according to Clifford Ashley, in his definitive *Book of Knots*, the type of knots tied by a sailor indicated the service in which he was employed. The Navy was the most thrifty, and its sailors had to content themselves with 'small stuff' (ie thin cordage), such as log lines and fishing lines, leading them to specialise in decorative knotting and macramé. The merchant navy apparently had plenty of hefty old rope (known as 'junk') to give away, which had to be teased out and reconstituted before it could be made into mats and suchlike. But it was the whaling ships that provided

the best habitat for the 'marlinspike sailor'. Not only did they spend the longest time at sea, thereby giving ample time for extra-curricular activities, but there was always some tired old harpoon line for their crews to practise on.

The development of knots was an international phenomenon that spread from ship to ship regardless of nationality or religion. For, while it is true that sailors guarded some of their more obscure knots like a secret family recipe, any knot that fulfilled a useful function was soon shared to benefit the whole ship – and indeed the whole seaborne community.

It was also uncontrolled and unregulated, which meant that the best knots emerged in time through trial and error and recommendation. They also acquired different names, not only from country to country but virtually from ship to ship. The common reef knot is variously known as the square knot (US), the reef knot (UK), the Heracles knot (Greece), the Hercules knot (Rome), and the love knot (romantic literature).

Symbolic knots

Apart from their practical function, knots have long been used as a metaphor in art and literature. The Ancient Greeks and Romans were particularly fond of the reef knot and used it as a motif in clothing and jewellery. The knot's neat symmetry, showing two ropes in equal and opposite union, made it a natural choice for anyone wanting to represent romantic union, and it was used in marriage rituals in both great civilisations.

Above **The knot of Heracles (otherwise known as the reef knot) has captivated artists since ancient times. This gold chain dates from 300 BC.**

Below **The Age of Sail, when great square riggers such as these sailed the world, was the peak time for knot-tying.**

History of Knots

Knots could also be problematic and difficult to untie including, most famously, the mythic Gordian knot. According to legend, after Gordias became King of Phrygia, the ox cart he had been riding was tied down with a complicated knot, whose ends were hidden from view. The story went that whoever managed to untie the knot would go on to conquer the East, including the much-desired Persia. Many people tried without success, until Alexander (later Alexander the Great) came along and sliced it open with one stroke of his sword. The story has been taken as a metaphor for solving apparently intractable problems with simple (albeit brutal) methods.

Knots have long been thought by mariners to have magical properties, including the power to control the wind. So-called wind-knots were tied into a piece of rope or a rag and sold to superstitious sailors, who would then untie the three knots they contained at an appropriate moment to release the wind. The 17th-century Norwegian poet Petter Dass explained what was supposed to happen next:

Untie but the one for a gentle,
good breeze,
The sails will be filled, you make
progress with ease;
But if you the second will loosen,
You pull in the canvas to barely
half mast.
The third will send wind that
will race you so fast
That pumps you will have
to resort to.

Even religion hasn't remained impervious to the potent symbolism of knots, which feature in both the Jewish Bible and the Koran. Indeed, Deuteronomy 22:12 states: 'You shall make yourself twisted threads, on the four corners of your garment with which you cover yourself.' This has been taken as an instruction by devout Jews, who attach precisely crafted lanyards, called *tzitzit*, to the four corners of their prayer shawls.

Into the modern era

The passing of the Age of Sail, and the advent of steam, is usually quoted as the reason for the lapse in interest in knot-tying at the end of the 19th and beginning of the 20th centuries. Steam ships needed fewer crew and passages were shorter, the logic went, meaning that sailors had less time on their hands to devote to the pursuit of knots. Clifford Ashley, interestingly, disagrees. He blames the passing of knots on improved education. As sailors became more educated and able to read, they found other ways to entertain themselves, mainly by reading books. Writing in 1944, he welcomed the emerging popularity of radio, which he said freed people's hands to play with bits of rope, and warned of the distracting effects of television and cinema.

Above **A prayer shawl decorated with knotted tassels, as prescribed by the Jewish Bible.**

Left **Faced with an intractable problem such as the Gordian knot, Alexander had a typically direct solution: cut it off!**

Ashley may have been right about the dangers of TV, but what he didn't anticipate was the effects of post-war prosperity in the West. With more free time to indulge in their personal interests, hobbies of all kinds flourished in the 1950s and 60s. Later, came the reaction to mass-produced goods and a renewed interest in traditional crafts of every description – including knot-tying. Whereas Ashley believed he was witnessing the end of a craft, he was in fact anticipating its revival.

In recent years, knot-tying has seen an explosion of interest, with many new books and countless websites devoted to the subject. The International Guild of Knot Tyers (IGKT), formed in 1982, now boasts over 1,000 members, with branches in North America, the Netherlands, France, Germany and New Zealand.

How many knots?

If you thought that every knot that could be tied in a piece of string must have been invented by now, think again. *The Ashley Book of Knots* claims to include 3,800 knots – although this includes many repeats of the same knots in different situations, so the true figure is probably less than 3,000. That was nearly 70 years ago. New knots are being invented all the time, as witnessed by the IGKT's quarterly publication *Knot Matters*. Of course, not all of them are all that useful, and there is always the temptation to add an extra turn to an existing knot to create a new one that performs rather less well than the original. But, while many inadequate knots will pass by the wayside, others will be taken up and may eventually challenge or even supplant the old favourites.

Even now, there is no definitive list of knots. In fact, finding exactly the right knot for the job is the main challenge. Few authors will agree even on the top ten knots, let alone a bigger selection, and the aspiring knot-tyer will have to read widely to investigate all the possibilities. The selection published by *The Admiralty Manual of Seamanship* isn't a bad starting point. A recent edition includes the following:

Reef knot, figure-of-eight knot, marlinspike hitch, marling hitch, timber hitch, clove hitch, constrictor knot, double blackwall knot, midshipman's hitch, bowline, running bowline, bowline in the bight, French bowline, monkey's fist, heaving line knot, fisherman's knot, crown knot, wall knot, manrope knot, Turk's head, square lashing, diagonal lashing, and various splices and whippings.

But there is no better indication of the everyday nature of knots than the fact that so few are named after people. Of the 200 in this book, only the Ashley stopper and the Matthew Walker knot take their name from real or fictional people. Even there, Ashley played no part in naming 'his' knot, which he referred to as the oysterman's stopper, while Matthew Walker is quite possibly a mythical figure. The point being that now, as ever, knots are made to serve people, not vice versa.

Below **A group of ratings learn to tie knots. Knowing your hitches could be a question of life and death in the Navy.**

Learning the ropes

Anyone can tie any of the knots in this book. All it takes is a bit of patience and a calm head. For the simpler knots, all you need are two 1.8m (6ft) lengths of rope about 9mm (¾in) in diameter, and only the most basic tools (page 18). There are a few basic techniques, however, that will ensure the experience is a pleasure rather than a chore.

Learning the ropes

The first rule of knotting is: start simple. There's a language of knot-tying, which you must learn before embarking on the more complicated formations, and, like all languages, it can only be learned through practice. Familiarise yourself with simple knots, and after a while your hands will feel their way around and almost anticipate your brain. That's when you're ready to move on to the next level. Tackling a difficult knot before you're ready can be intensely discouraging and put you off the whole business – unnecessarily.

A simple rule to follow is never leave a knot until you can tie it without looking at the instructions (words or pictures) – not just minutes later but the next day and the day after that. Keep coming back and challenging yourself to tie the knot from memory. It's amazing how quickly it implants itself in your brain.

If you're struggling with a knot, or a particular step, try turning the page around and tying it from a different angle.

Below **Trainees aboard the yacht *Brilliant* are taught some basic knots, before heading out off the coast of Nova Scotia.**

Rope care

The second rule of knotting is keep your ropes tidy. Badly coiled ropes, or ropes with frayed ends, create a distraction you just don't need when you are tackling a new knot. Use the coiling techniques described on pages 186–195 to keep the rope tidy. If it's old rope that's full of twists, shake them out and start afresh. This is best done with the rope on the floor, shaking the whole coil to clear the twists – like a garden hose.

In the old days, new rope made from hemp was stiff and unworkable. One technique for softening it was to uncoil it and

tow it behind the ship for a few hours. Once one end was done, you would turn it around and tow it from the other end – making sure both ends were properly whipped beforehand. Modern ropes are much softer and easier to work with and unlikely to need such treatment, but if you do try this, make sure you're well away from other boats and fishing pots – and beware of catching the line in the prop.

Keeping the ends of the ropes well sealed or 'whipped' pays dividends. An unsealed rope soon becomes frayed and, even when twisted back into shape, never quite regains its true shape. Use the whipping techniques described on pages 246–253 to keep your ends tight. Modern ropes usually come 'ready-sealed' and can easily be resealed using a small blow-torch or lighter – although there's something about an old-fashioned whipping that looks the part like nothing else.

The traditional way of cutting rope was with a hatchet on a block of wood. Nowadays, hot knives are available quite cheaply and seal the ends of the rope at the same time as cutting it. For most of us, however, a simple sailor's knife will suffice. Make sure it's sharp and make sure you cut onto a firm surface – such as a chopping board or a block of wood. Wrapping insulating tape or putting a stopping (eg a constrictor knot, page 38) on either side of the cut *before* applying the knife will prevent the rope unravelling.

If you're cutting to length, always cut a bit more than you think you need. It's generally easy to get rid of any extra length, but awfully hard to add it on. And remember the old carpenter's saying: measure twice, cut once.

Washing rope

Working with salty or dirty rope isn't much fun. It also creates abrasion, which shortens the life of the fibre. Soak it and wash it in a bucket or bath of warm water, using a mild detergent. Alternatively, most synthetic ropes can be put in a washing machine. Use the setting for wool (ie delicates) and don't tumble dry. The best way to dry rope is to lay it out in a well-ventilated place, preferably away from direct sunlight, which degrades the material.

Tightening the knot

Just because you've got the rope in the right position, doesn't mean you've tied the knot. Tightening is an integral part of the process and can make or break a knot – particularly the more complicated varieties described in Chapters 4 and 7. Work your way around the knot methodically, never losing sight of the intended shape. This can take as long or, in the case of the ocean plait mat, longer than tying the knot itself. If the knot is very tight, use a pair of pliers to work it, applying just enough grip to pull the rope through without damaging it.

Below **It can be worth investing in a hot knife, which automatically seals the end of synthetic ropes while it cuts them.**

Tools of the trade

In the days of sail, there were only three items a rigger carried aloft: a knife, a marlinspike, and a 'horn' containing a dollop of tallow for greasing the rope. Anything else was a bonus. Nowadays, the advent of wire rigging means the modern rigger has to carry a much bigger range of tools (cutters, swagers, etc), but for most knot-tyers, only the basics are necessary.

Essential tools

The first and only truly essential tool is a knife. A traditional rigger's knife is made of mild steel, with a wooden handle and a squared off blade – you don't want to stab yourself in the arm while you're swinging in the rigging. In truth, almost any knife will do the trick, as long as it's sharp and preferably has a sheath to protect it and you from any nasty accidents.

The other classic rigger's tool is the marlinspike. Traditionally, this was a steel spike about 225–300mm (9–12in) long, with a rounded head and a hole at the top for attaching a lanyard. This was used for opening strands of rope while splicing, as well as easing apart tight knots. The rounded head allowed it to be pounded with a mallet when working with stiff rope or wire. Nowadays, a diminutive marlinspike is included in most pocket knives designed for yachtsmen (such as the ubiquitous Captain Currey Lockspike Knife) or else combined with a shackle key in a holster kit. Either is adequate for the small and medium stuff, but will be completely inadequate for the larger stuff (25mm [1in] diameter and over).

A useful addition to the marlinspike toolbox is the fid. Essentially a slender wooden (or whalebone) cone, it is used in a similar fashion to the marlinspike – but never with a hammer. Fids come in a range of sizes, from 75mm (3in) upwards, depending on the type of work being done. As a rough


Seaman's knife


Wooden fid


Marlinspike


Swedish metal fid


Serving mallet


Heaving mallet


Palm

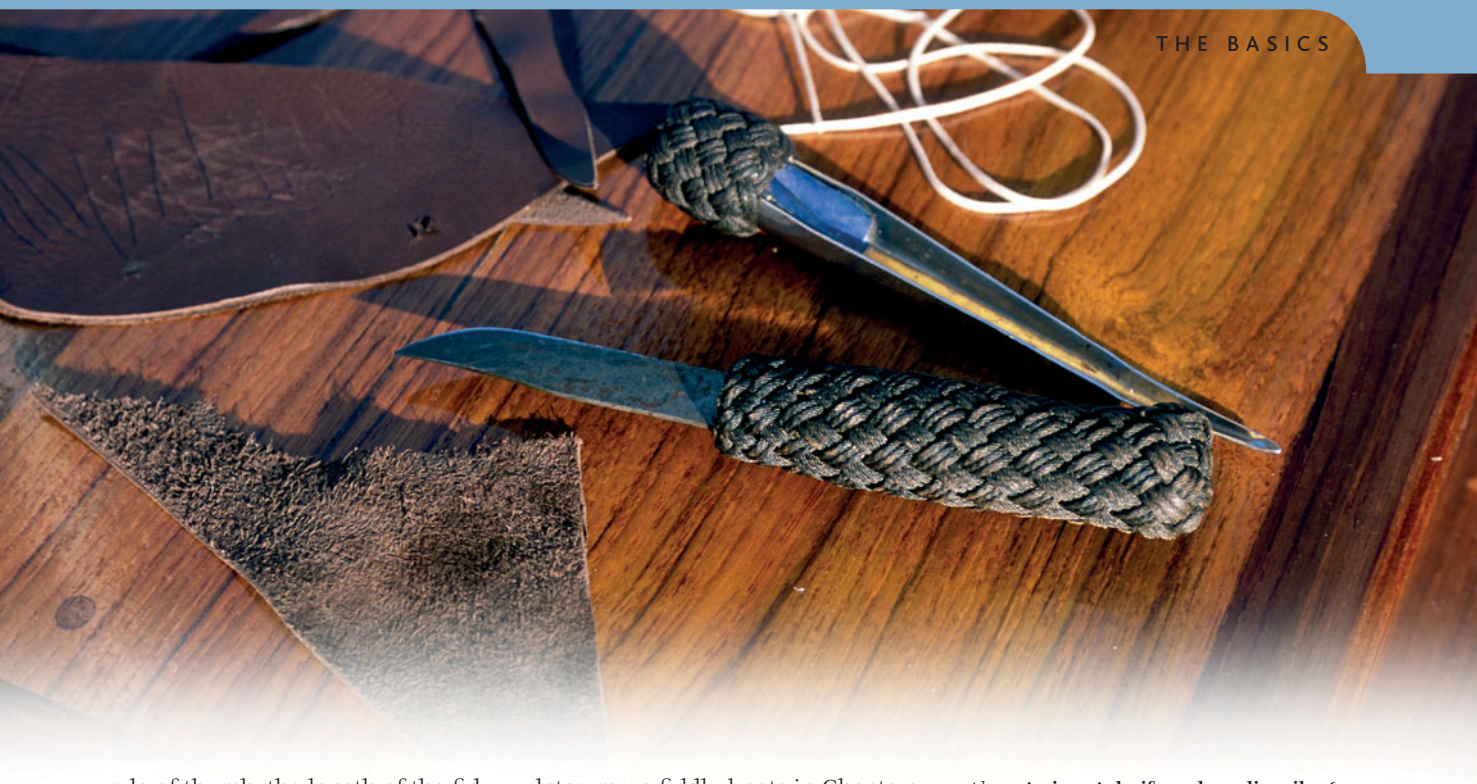

Parallel pliers


Waxed twine


Various twines


Sailmaker's needles

Hot knife



Above **A rigger's knife and marlinspike (or, strictly, a fid). You don't need much else for 90 per cent of the knots in this book.**

rule of thumb, the length of the fid should be 21 times the diameter of the rope, eg the fid for working with 10mm (3/8 in) rope would be 10 x 21 = approx 210mm (8in). Nowadays, the so-called Swedish fid – with its hollow metal blade and wooden handle – has mostly supplanted the marlinspike and is often the only dedicated rigging tool that is stocked by chandlers.

Non-essential tools

An ingenious modern invention, once the province of the professional but now increasingly targeted at the amateur, is the hot knife. Essentially just an electrically heated blade mounted on a gun or stand, it has the advantage of sealing the ends of the rope as it cuts it, thereby preventing the strands from unravelling. Use only with synthetic ropes, never with traditional hemp.

Unless you've got strong hands and impervious skin, a pair of long-nosed pliers will make life much easier when it comes to tightening a knot, particularly the later, more fiddly knots in Chapters 4 and 7. The regular type available from most DIY stores will do the trick nicely. If you're worried about damaging the rope, wrap it with a piece of cloth before using the pliers.

For the finer, detail work, such as whipping, you'll need a set of three-sided sailmaker's needles and some waxed whipping twine. The twine comes in many colours, which can be useful to create fancy effects. It can also be used to make miniature knots for jewellery, such as monkey's fist earrings or pendants. Alternatively, a ball of tarred twine does the job very nicely, and smells wonderful too!

A palm is the sailmaker's equivalent of a thimble, except that it's held by a leather strap and is designed to sit in the palm of the hand. This means that greater pressure can be exerted on the needle as it's pushed through layers of sailcloth – or, in this case, strands of rope. Its only application within the contents of this book is for making whippings.

Beeswax is another traditional material used by the marlinspike sailor. Draw a thread trhough a small block of beeswax to close the pores and keep the moisture out. It can also be used as a lubricant when drawing a stitch through canvas or leather.

Essential tools

Knife
Marlinspike or fid

Additional tools

Various fids
Pliers
Mallet
Palm
Needles
Whipping twine
Ball of twine
Beeswax

Types of rope

The choice of cordage available even in a small chandler's can present a baffling obstacle to the average person going to buy a length of 'rope'. Suffice to say that, if you just want to practise a few knots, then any rope will do. Most of the knots in this book (splices and decorative knots excepted) can be tied using two 1.8m (6ft) lengths of 10mm (3/8in) rope of pretty much any classification.

Above **Modern ropes are available in a variety of colours, which makes identification of specific lines easier.**

Natural vs synthetic

The most important choice when selecting rope is between natural and man-made fibres. By and large, people tend to fall into one camp or the other and will develop a slightly different set of tools and techniques accordingly. Even if both are used, you are strongly advised not to mix the two in one piece of work, as the materials will move differently and the man-made fibres will tend to abrade the natural ones.

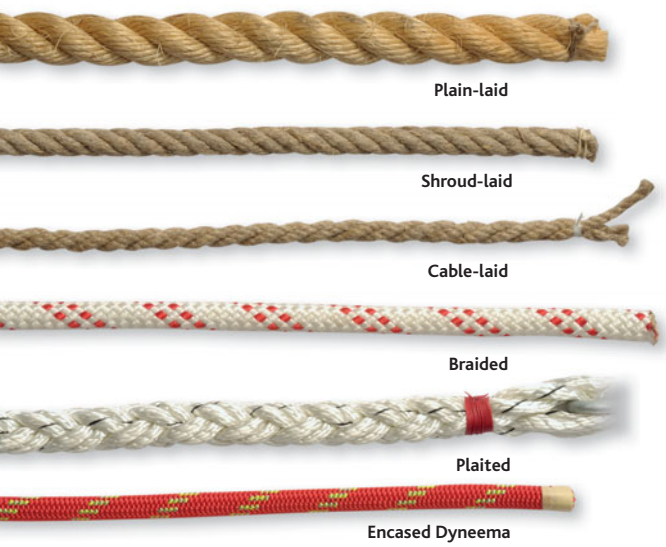
Natural fibre

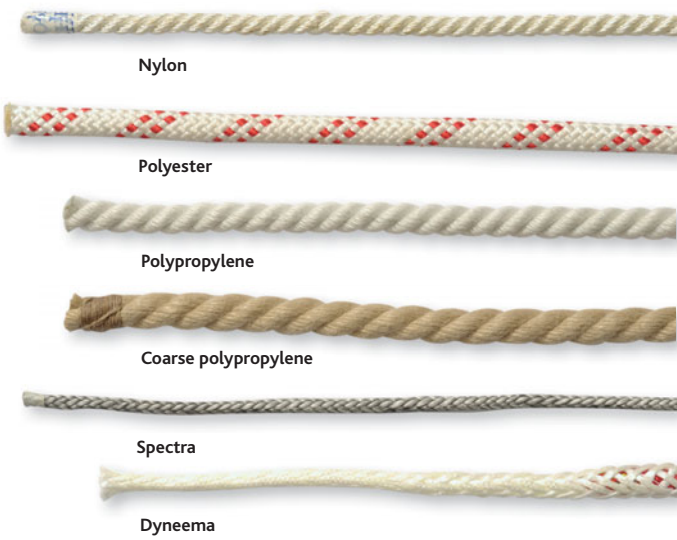
For thousands of years, rope has been made by teasing apart the fibres of plants, such as cotton, flax, coir, sisal, manila and hemp, and spinning them into yarns. The yarns are then twisted into strands, which are then twisted into rope. Each section is twisted in the opposite direction to the previous one, which is what holds the rope together.

Most natural fibre rope is made up of three strands, which is called plain- or hawser-laid. Four-strand rope is called shroud-laid. If three or more lengths of three- or four-strand rope are twisted together to make an even larger rope, it is called cable-laid.

Generally, the more strands there are, the weaker the rope. Therefore a 10mm (3/8in) four-strand rope is 10 per cent weaker than a three-strand rope of the same diameter, while a nine-strand rope is 40 per cent weaker. The best way to increase the strength of the rope is to increase the size of the strands, not the number of strands.

Natural fibre rope has several disadvantages. When wet, it swells and makes knots difficult to untie and, unless carefully stored, it tends to attract moisture and rot. It's proportionally less strong than synthetic ropes, so a thicker diameter rope is needed for the same purpose. Also, when new, it's stiff and unmanageable and rough on the hands. For all these reasons, it's rarely used on boats nowadays – although its pleasing texture and organic colours mean it's still a popular choice for decorative knots, such as the ocean braid mat (page 240).





Synthetic ropes

Since the invention of nylon in 1938, synthetic ropes have rapidly replaced natural fibre varieties. Not only are they stronger for their size, but they are also rot- and sun-resistant. What's more, they can be produced in a variety of different colours, which means the running rigging on a yacht can be colour-coded for ease of use. It's easy to get carried away with this, however, with the result that some boats can end up looking like rope pizza.

The other major drawback of synthetic ropes is that they tend to be smoother and more slippery, which is nice on the hands but means knots can come undone (or 'capsized') more easily. The solution is usually to add a half hitch or two, or even a seizing, although this is time-consuming and not as pleasing to the eye as a plain knot.

Broadly speaking, synthetic ropes divide into three categories: Nylon, which is also marketed as Polyamide, Bri-Nylon and Enkalon. This is a stretchy fibre that does not float, and is suitable for mooring lines, anchor warps and towing ropes. Polyester, which is also marketed as Terylene, Dacron, Tergal and Fortrel is not quite as strong as nylon, but it stretches less, making it ideal for halyards and other parts of the running rigging where stretch is undesirable.

Polypropylene, also known as Polyethylene. This is the cheapest, and weakest, of the lot. Its main advantage is that it floats, which makes it useful for water-ski ropes, rescue lines and heaving lines.

New ropes are coming onto the market all the time, such as Dyneema, Spectra and Kevlar. Your local chandler will be able to advise you on the more specialised (and expensive!) varieties.

The weave

The other big difference with synthetic ropes is that they are woven in several different ways. As well as the usual three- and four-strand laid ropes, there are plaited ropes, braided ropes, and endless combinations of all three. You can buy a rope with a 16-strand sheath over a three-strand core, or four-strand rope laid over a one-strand core, or even a braided sheath over a braided core.

The main thing to remember, however, is that three- and four-strand rope stretches more than plaited and braided ropes. This is why it should always be used for mooring lines, where it absorbs some of the shock, while plaited and braided rope is best used for running rigging, where it maintains the tension.

Left **Salt water not only makes lines harder to handle but also degrades the fibre. Wash your lines regularly with fresh water.**

Terminology

Sailors are famous for their jargon, and knot-tyers and riggers are no different. But this specialised vocabulary came about for good reason. After all, with 3,000 or so knots to choose from, it would be no good to tell a deckhand to simply 'tie a knot' when what was needed was a constrictor knot in the bight (page 41). Likewise, the different parts of a knot need naming to make their explanation that much clearer.

Above **Is it a bight or a loop? Knots have their own jargon which you need to familiarise yourself with.**

When a knot is not a knot

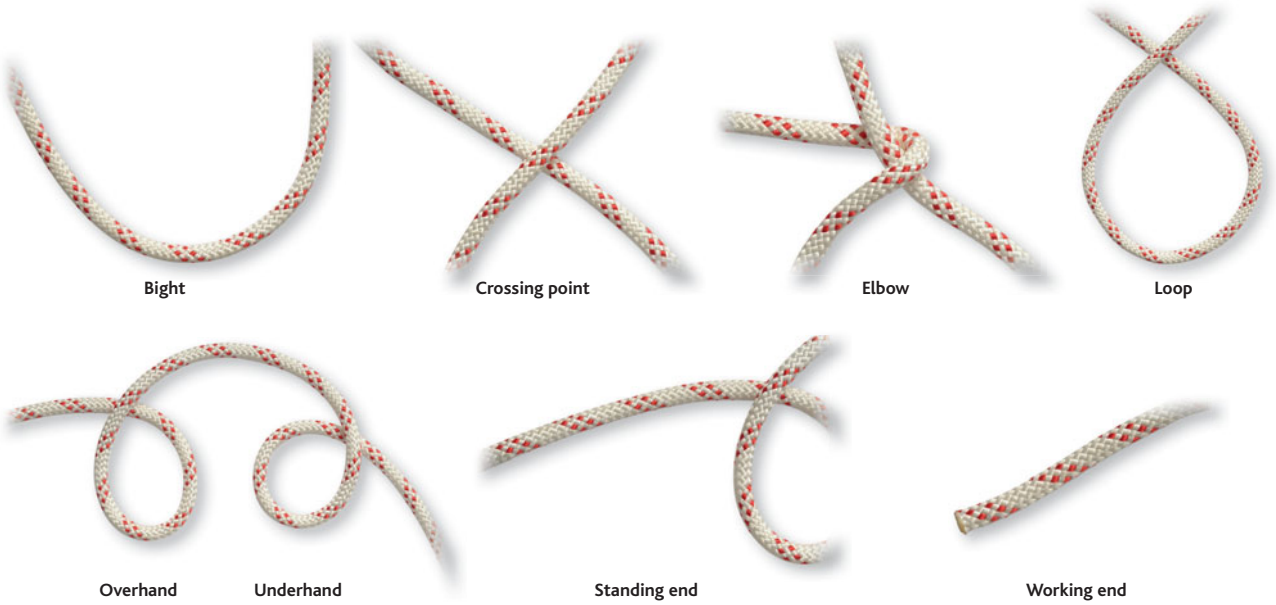
First off, what is a knot? On one level, the term includes every twist and turn shown in this book, from camel hitch to Turk's head. Strictly speaking, however, when rope is tied to another object, it is known as a *hitch*. When two ends of rope are tied together, it is known as a *bend*. When the strands of a rope are unlaid and woven to another rope or onto itself, it's a *splice*. Anything else – including a loop – is simply a knot.

Working words

There are specific terms to describe the various parts of a knot while it is being tied. The active end is called the *working end*, whereas the end not in use is called the *standing end*. The inactive section of rope nearest the knot is called the *standing part*. Any part of the rope between the ends is referred to as the *bight*, and if a knot is tied in the bight it means it is tied without passing the ends of the rope through it, eg a clove hitch in the bight (page 34).

Just to confuse things, a curved section of rope within a knot-in-progress is also referred to as a *bight*. Once the rope is crossed, the bight becomes a *loop*. A loop is *overhand* when the working end is laid on top of the standing part; it is *underhand* when the working end is laid under the standing part. The place where the rope crosses to make the loop is the *crossing point*. Place two or more loops in close proximity, and they become an *elbow*.

If you use the bight, instead of an end, to tie the last part of a knot, you create a loop, which means the knot can be *slipped*. This makes untying the knot much easier, but it doesn't mean the whole knot will come undone with a single pull. That is the province of *exploding* knots, such as the exploding clove hitch (page 35).



If you wrap a rope around a bollard or post, it's called taking *a turn*, or taking *a single turn*. Wrap it around once more, and it's called *a round turn*. Wrap it around again, and it's called *two round turns*.

Lines vs rope

Finally, there's the idea that there are only ever *lines* on a ship, and never *rope*. It is true that, once a piece of rope has acquired a specific function (eg raising a sail, mooring the vessel) then it becomes known as a line. A loose piece of rope with no designated purpose is, however, still a piece of rope. And there are some ropes that have specific functions that never acquire the prestige of becoming lines, such as bell ropes, bolt ropes and foot ropes.

Knot scores

All the knots in this book are awarded a five-part Knot Score, with their strength, security, ease of tying, ease of untying, and usefulness given a grade from 1–5. At first glance it might seem superfluous to treat strength and security as separate categories – after all, a knot either holds or it doesn't hold, right? There are, however, certain knots that, because of their inherent design, are liable to break the rope before they slip, while others will slip before they break.

The distinction is all the more important given the widespread use of synthetic ropes, which tend to be very strong but also rather slippery. Given a strong, slippery length of rope, you are better off using a knot that scores highly on security, but less highly on strength. On the other hand, if you are using natural fibre rope, which has good grip but is weaker than synthetic rope, then you might be better off choosing a knot that scores highly on strength but less highly on security. It's horses for courses – or turns for yarns.

It goes without saying that, just because a knot is easy to tie, that doesn't mean it's easy to untie; or that a knot that is difficult to tie is necessarily difficult to untie – hence each of those categories are scored differently. The higher the score, the easier it is to tie or to untie.

Lastly, 'usefulness' is clearly a subjective term: what might be an essential knot for one person might be regarded as frivolous by another. Equally, there's no doubt that, at some point, every knot will be just the right knot for the job – if you're dismasted at sea, for instance, there will be no better knot than the jury mast knot (page 180). There are, however, certain knots that have universal application – eg the ever-versatile one round turn and two half hitches. The 'usefulness' score is intended to suggest what would be most useful to the average sailor in normal day-to-day usage. Learn all 200 knots, and you'll be covered in almost any circumstance.

Above **A practical application of a 'decorative' knot: a turk's head is tied onto a mainsheet traveller.**

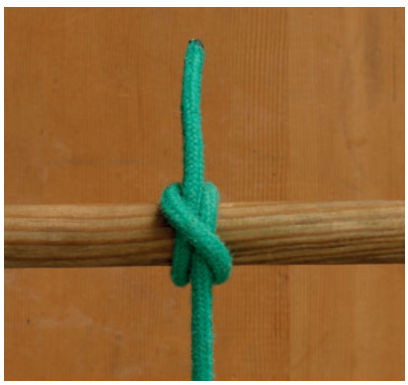
Top 10 most useful knots

Not everyone has time to learn 20, let alone 200, knots. And it is true that in day-to-day life most sailors manage perfectly well using only a handful. Which knots those are, you'll only find out by practising as many as possible, but the following is a selection that should cover most eventualities – even if some come with health warnings.

Figure-eight (page 150)
It's not much more than an overhand knot with an extra turn, but that extra turn makes the world of difference. Whereas you might struggle to undo an overhand knot, generally speaking, a figure-eight will untie with relative ease. It is ideal for stopping sheets from slipping through a block or jammer. Or, for a more sophisticated (and bulkier) alternative, try Ashley's stopper knot (page 152).

Round turn & two half hitches (page 28)
The workhorse of knots. There's nothing very pretty or glamorous about a round turn and two half hitches, but it will get you out of trouble again and again. The round turn spreads the load, so it's kind on the rope, and if you want to make the knot more secure, all you have to do is throw in another hitch, or seize the end to the standing part. If you only ever learn one knot, learn this one.

Bowline (page 112)
The true sailor's friend, the bowline is quick to tie, reliable and easy to untie. It's also extremely versatile, and the number of variations it has spawned is evidence of what an ingenious knot it is. That said, it's not without its critics, who accuse it of being unreliable. They might prefer the midshipman's hitch. Yet this writer has 40 years' experience of the bowline, without ever being let down.



Clove hitch (page 32)
Probably one of the most useful, and yet least reliable, knots in existence. The clove hitch can be used on posts, bollards, rings, bags, and almost anything else you can think of; it can be doubled, tied in the bight and slipped. As an instant solution for securing a line, it's almost unbeatable. But don't rely on it in the long term. There will almost always be a more reliable knot to do the job. For tying a mooring line, use a lighterman's hitch (page 62); for tying fenders, use a round turn and two half hitches (page 28); for seizing a bag, use a constrictor knot (page 38). Despite all that, the clove hitch is still a very useful knot to know.

Rolling hitch (page 37)
A development of the clove hitch, the rolling hitch has an extra turn that not only makes it that much more reliable but also gives it a special function: to prevent a line slipping on a smooth surface. This can be a lifesaver when securing a line to a spar, for instance, or to another line, eg a dinghy painter onto a mooring line. Use with similar caution to the clove hitch.

Reef knot (page 156)
Much-beloved of sailors and artists alike since antiquity, the reef knot holds a special place in the pantheon of nautical knots. And, used as a binding knot, it has few equals. Where it falls down is if it is used as a bend, ie to join two ropes together. Use other knots for this purpose, such as a zeppelin bend (page 86). If you want to reef your sails, however, there's no better knot than a reef knot.

Zeppelin bend (page 86)
Anyone tempted to use a reef knot as a bend, ie to join two ropes together, should learn this knot instead. Not only is it elegantly simple, it does the job thoroughly well. Despite its many merits, the zeppelin bend is relatively unknown, and even the usually infallible Clifford Ashley seems to have missed it in his encyclopaedic *Book of Knots*.

Sheet bend (page 80)
It looks like nothing at all, yet the sheet bend can hold the weight of an entire ship. Its primary purpose is joining ropes of different thicknesses, although, at a pinch, it works well enough on ropes of the same size too. If you feel nervous about entrusting your pride and joy to such a fragile-looking knot, you can secure it with a seizing – although in truth it will probably be superfluous.

Fisherman's knot (page 100)
Another deliciously simple knot. On the rare occasions where a round turn and two half hitches is not secure enough, the fisherman's knot (alias the anchor bend) will stand you in good stead. And, if you're still not completely convinced, you can always throw in a couple of half hitches for good measure. Its only minor drawback is that it's not the easiest knot to untie.

Cleat hitch (page 66)
It's certainly one of the simplest knots and wouldn't deserve to be included in this list, were it not for the frightening frequency with which it is tied incorrectly. Tie it right, and you'll sleep soundly at night; tie it incorrectly and you'll at least chafe your mooring lines or you could end up with a boat pile-up. And it's not just a matter of piling on as many turns as you can.

Hitches

Round turn & two half hitches

It's one of the least glamorous knots in a sailor's inventory – yet also one of the most useful. The round turn and two half hitches is a dependable old workhorse that can be put to good use on land and at sea – and probably in the air too. It's also one of the oldest knots in existence. If you learn only one knot, learn this one.

1 Take a turn around the mooring point – in this case a horizontal pole.

Some things are so simple we tend to take them for granted. Like making a cup of tea, or riding a bike. Or, in the case of sailors, a round turn and two half hitches. But ask a non-tea drinker to make tea, or a toddler to ride a bike, or a knot novice to tie a round turn and two half hitches – and you soon realise there's more to these things than you first imagined.

The key to a round turn and two half hitches is to keep going. Once you've put in the first hitch – either clockwise or anticlockwise around the standing part – keep going in the same direction for the second hitch. It's as simple as that.

It might help to think of the knot as a clove hitch tied onto the standing part of the line. And the key to tying a clove hitch is also to keep going.

Despite its simplicity, the double hitch has some ardent admirers. Ashley quotes Admiral Stephen Luce, founder of the Naval War College in Newport, Rhode Island, as saying: 'Two half hitches will never slip.' Another anonymous source says: 'Two half hitches saved a Queen's ship.' Combined with a round turn to spread the wear, it's an even better knot.

Feel tempted to throw in a third half-hitch, just to be sure? Admiral Smyth is quoted as saying: 'Three half hitches are more than a King's yacht wants.' But no one will tell him if you do!

KNOT SCORE

Strength	
Security	
Difficulty Tying	
Difficulty Untying	
Usefulness	

2 Take a second turn. This spreads the load, reduces wear, and prevents the line slipping.

3 Pass the working end over the standing part, and tuck it in between the two parts to create the first hitch.

4 Repeat the previous step to create a second hitch. Tighten by pulling the standing part taut and working the hitches snug against the pole.

Seized round turn & two half hitches

Tied using traditional ropes, a round turn and two half hitches will probably outlive its tyer. Modern cordage is a good deal more slippery, however, and if you want something long-lasting, a seizing will transform this modest knot into a permanent solution. For more on seizings, see page 254.

KNOT SCORE

Strength
Security
Difficulty Tying
Difficulty Untying
Usefulness

1 Tie a round turn and two half hitches in the manner described above. Make sure the knot is tightened before putting in the seizing.

2 Lay the working end next to the standing part and take several turns with some whipping twine. Tie off securely – with a round turn and two half hitches, of course!

Round turn & buntline hitch

Similar to a round turn and two half hitches, the buntline has one crucial difference: the hitches are tied in the opposite direction. This means the short end becomes jammed in the knot itself, making it very difficult to untie.

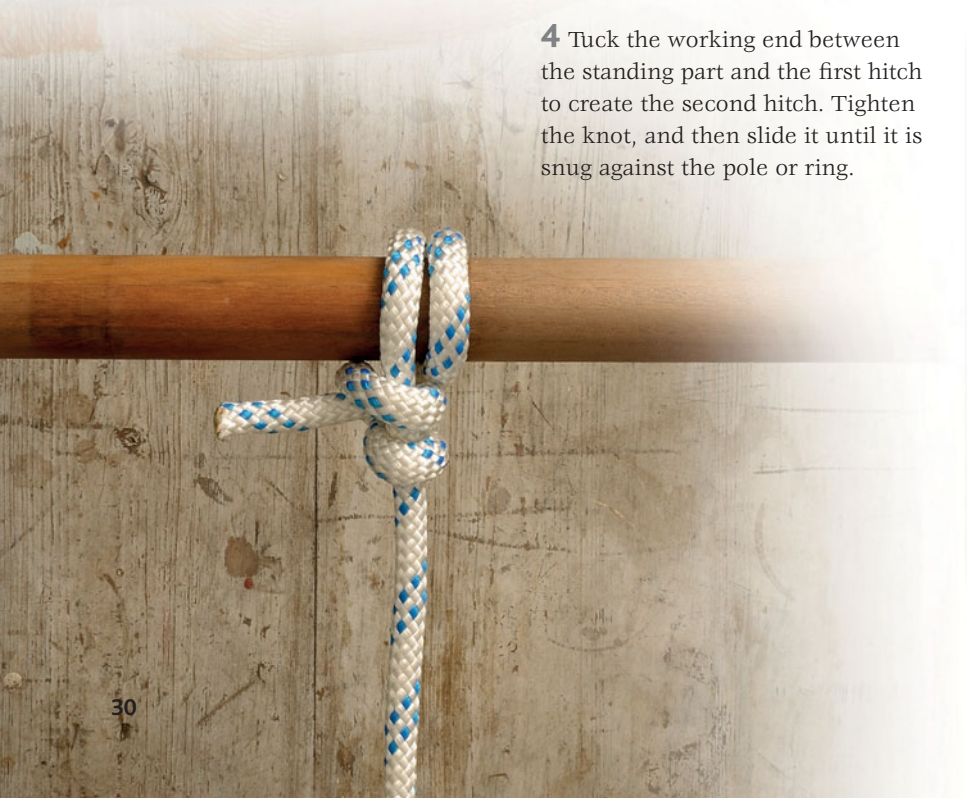
KNOT SCORE

Strength
Security
Difficulty Tying
Difficulty Untying
Usefulness

1 Pass the working end over the post or ring – commonly a spar or mooring ring.

2 Take a full turn, in the same manner as a round turn and two half hitches.

3 Pass the working end over the standing part and around the back of the knot.



4 Tuck the working end between the standing part and the first hitch to create the second hitch. Tighten the knot, and then slide it until it is snug against the pole or ring.

KNOT KNOW-HOW

On square-riggers, buntlines were lines that hung from the spars on the leeward side of the sails. When the sails were being stowed, the buntlines were tightened to prevent the sail flogging. The rest of the time, the buntlines hung loose and were themselves battered incessantly by the wind. They therefore needed an extremely secure knot to attach them. Hence the buntline hitch. The same knot, in essence, is used to tie neckties.