

ISSUE 57    AUTUMN-SEPTEMBER 1997  
ISSN 0959-2881

# Knotting Matters

Newsletter of the

The logo is a circular emblem. In the center is a detailed illustration of a reef knot (square knot). The words "INTERNATIONAL" and "TYERS" are written in an arc along the top and right sides of the circle, respectively. The words "GUILD OF KNOT" are written in an arc along the bottom and left sides of the circle, respectively.

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# **KNOTTING MATTERS**

**THE QUARTERLY NEWSLETTER OF  
THE INTERNATIONAL GUILD OF KNOT TYERS  
ISSUE NO 57 AUTUMN - SEPT 1997**

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# KNOTTING MATTERS

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## EDITORS BYTES AND PIECES

Just, a correction and some notes from Geoffrey Budworth and others in this issue of E.B.&P.

KM 55, page 27, column 1, amend '8 part x 5 lead' to read '8 lead x 5 bight' (the caption for the diagram is correct). This was my mistake - writes Cy Canute - and not an editorial one.

**Supplier's Update:** The full range of *Amosco ODS* products previously reviewed in KM 52 (April 1996) is now more widely available from their warehousing facilities in Aberdeen (tel: +44 [0]1224 898456), Sevenoaks (+44 [0]1732 463888) and Great Yarmouth (+44 [0]1493 440024).

### **La Science des Noeuds.**

For any keen collector of **printed** knotwork the April 1997 issue of *Pour la Science* (the French edition of 'Scientific American' magazine) is not to be missed. the entire issue is devoted to a learned look at knotting, with nineteen glossy and colourful articles from élite experts who include Geoffrey Budworth, Vaughan Jones, Lee

Neuwirth and Jearl Walker. Topics range from maritime to mathematical, featuring cats' cradles and Celtic artwork, plaits and prestidigitation, D.N.A., topology and even a bit about chaos theory.

Try your newsagent first - but, if that fails, contact: Françoise Cinotti, *Pour la Science*, 8 re Féro, 75006 PARIS, France  
From Geoffrey Budworth:

From an account of an English battle in February 1461. . .

"The Yorkists made great use of nets across gaps in the hedge-rows; these nets each being about 24 ft. in length and 4 ft. wide, could not be passed over by man or beast without injury from nails attached to every second knot, which stood upright when the nets were in place."

*The Military Campaigns of the Wars of the Roses*, by Philip A. Haigh, pub. (1995) Alan Sutton Publishing Ltd.

### **Knot Garden Gone**

by Geoffrey Budworth

The Giant Knot Garden on the South bank of London's River Thames has gone. I was there in

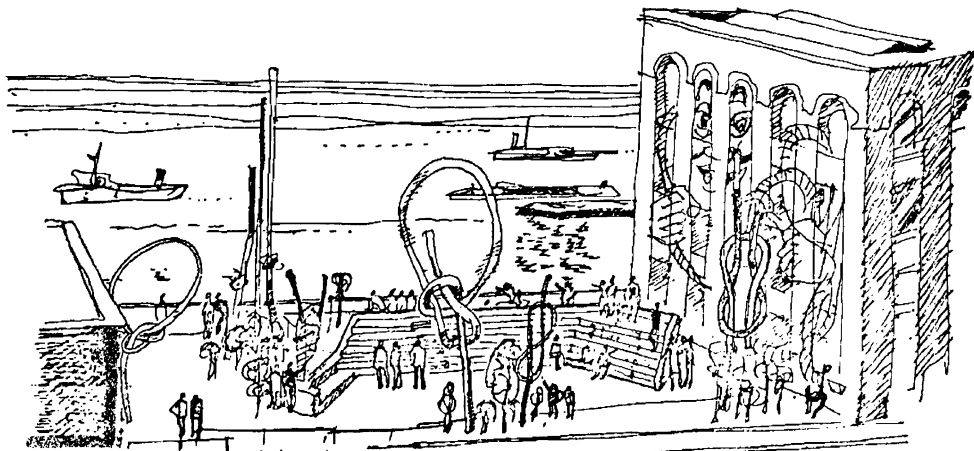
March and some construction company had fenced off the site and was building on it.

This was no formal English flower and herb patch - under-stand - but an assembly of life sized cable-laid 'trees' of rope around metal armatures tied in various sailor's knots. It was the surreal concept of architect (and subsequent Guild member) Tom Meddings, winner in 1981 of a competition to transform the open space at 125 Rotherhithe Street, S.E.16, alongside Brander's Wharf, with funds from the Arts Council (now defunct) and the Department of the Environment. The challenge was entitled 'Art into Landscape' and organised by the Arts Council, the Royal Institute of

British Architects, the Institute of Landscape Architects and the Sunday Times.

I was at the opening on Monday, 6th. July 1981, celebrated on-site and then in the historic Mayflower public house just a throwing-line's length upstream, as well as within hailing distance - it later transpired - of Lee Boo's burial place in St. Mary's churchyard (see KM 30, page 22 and also KM 37, page 16); and I.G.K.T. publication *Much Ado About Knotting* records the Guild's first public venture there on Saturday 4th. June 1983.

Sadly - like the G.L.C. - Tom Medding's Giant Knot Garden no longer exists.



## Notes From The Secretary's Blotter

After the rambling notes in the last KM, I shall be quite brief this time. For one thing, having just moved house, I cant actually find the blotter from which I take the notes.

As with anyone involved in moving house in this country, it was a very traumatic experience, made much worse by the increasingly obscure and obtuse questions raised by the legal profession. We eventually exchanged contracts at 5 pm on the Friday evening, ready for a Monday morning move. This did not give us much time to properly organise ourselves, especially as it was a two day move, and we were booked to go on holiday on the following Saturday.

The net result of all this was that my office was effectively closed for something over five weeks whilst it was dismantled, and then completely reassembled in a room half the size of the original. No doubt many members were beginning to wonder what had happened. My apologies to all of you who had to wait an eternity for a response of a sort from me.

I would like to take this opportunity to thank John and Audrey Addis who for the last couple of years have helped me 'stuff' KM and get it ready for posting. John has become so enthused by this experience, that he has now taken on the role as Secretary of the East Anglian Branch, and has organised some interesting meetings. My thanks to John, and I wish him every success with the East Anglian Knot Tyers.

Perhaps there is a member not too far from Uckfield, (conveniently situated on the A22), who might have a little time to spare, and would like to join Sylvia and me for an evening of 'stuffing'.

A point to note for the West Country knotters, is that Mrs. Maria Venn, 49 Bush Avenue, Stoke Gifford, Bristol, BS12 6NE, telephone 0117 9315847 (answer machine too) has now taken on the role as secretary of that branch, Richard Hopkins now being the treasurer.

One of our members has an interest in string stories, and mnemonics. If any one knows of any, such as the rabbit running round the tree, and back down the hole, please let me know so that we can pass them on.

Just a reminder to those splendid members who pay their subs by Bankers Order. As you know, the subs will be going up in January, and it will be necessary to change your Standing Order. I shall be sending out a revised form, (together with a Deed of Covenant form for those UK taxpayers who have not yet filled one in), in time for the end of the year. If there is anyone else who would like to pay their subs by Standing Order, please ask me for a form.

Just a little news about 'The Knot Book'. The publishers have advised me that this is currently out of print, but will reappear towards the end of the year in a slightly enlarged, and no doubt more expensive edition. I have no stocks left of the existing edition, you will have to be patient until then.

Those who have an interest in Turks Heads should note that Harold Scott has recently published a fascinating book on Cruciform Turks Heads, which is a must for the connoisseur. See the inside cover of KM for details of this and all the other Guild Supplies. I must stop now, or this won't be a brief note after all. I hope to see many of you in Liverpool. Best wishes - Nigel - please note my new address

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## Swedish Branch First Meeting

by Olof Nystroem

Somerled Karlsson having initiated the first meeting of the Guild's Swedish Branch, 9 members and 2 guests met on Saturday July 5, 1997 at the National Maritime Museum in Stockholm. We started by studying and admiring David Davenport's impressive collection of knots and other marlin spike seamanship, displayed for a long time in the Museum's premises.

Special honorary guests were Liz and Des Pawson, who had spent some time cruising in the Swedish waters with Sten Johansson in his sailing boat.

The meeting being the first general gathering of the Swedish members a prime issue was of course getting acquainted. This was quickly done, thanks to the somewhat odd fascination tying us together.

We enjoyed a very interesting guided tour through the museum and then had some formal proceedings regarding the Branch's future activities. We abstained from forming a legal

entity with a Board of Directors and so on. The result was that I, the undersigned, undertook to act as kind of a Communication Center for the Swedish members.

Des demonstrated the making of environment-friendly fenders of a convincing beauty.

A very impressive visit followed in the rope-makers workshop of Pille Repmakare in the Square-sailors' House at Skeppsholmen.

Gunnar Fagerlind guided us during a visit onboard the *af Chapman*, former school-ship of the Royal Swedish Navy, now a youth hostel and restaurant. As a boy Gunnar was once trained on board the ship as a member of the naval rating's preparatory school.

Next day, Sunday 6, we went to Elmsta, north of Stockholm, Situated in Roslagen, a former center of coastal shipping. There is a very interesting and very well arranged Museum, concentrating on ship-building, locally-based shipping, fishing, sail and rope-making, manufacturing of steam engines, marine motors, the navigation techniques and much more.

The gathering was blessed with formidably sunny weather. Pille was greatly impressive wearing a basket cap with a built-in fan, powered by a solar panel on the top. The Branch intends to meet annually. Further information from;

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## FROM OUR POST- BAG

**from:** Ken Yalden

### *BELL PULLS?*

Pull the other one Ed. What you saw a T.S. Blake really were bell ropes. Please may I explain.

1. **'SHIPS' BELL ROPES** - are the shortest designated rope on a ship - other ropes that come to mind, man ropes and bolt ropes, to name but two. A ships bell rope is the short lanyard, traditionally very decorative and only one and a half times the diameter of the bell in length, joined to the clapper by a shackle. Woe betide any bos-

ons mate who actually holds the bell rope to ring the bell; on two counts, one the shackle will permit a bend like an elbow between the rope and the clapper giving an ad hoc number of rings, and a thick war when the 'officer of the watch' catches up later. Two, bosons mates have dirty hands.

### 2. **'CHURCH' BELL ROPES**

are long ropes from the belfry to the bell ringing chamber - for whom the bell tolls. I hear rural bell ringers are well versed at beer drinking too. Ashley #3487 explains the making of a bell rope Sally for those who are interested.

3. **BELL PULLS** come from 'upstairs and downstairs' days, when those who wished to summon a servant from downstairs to the upstairs, pulled the 'bell pull', a cord running from the bell box, with indicators, in the kitchen downstairs to a decorative tape or strap (upstairs). The puller always had clean hands, because it was the servant who put the knobs of coal on the fire. In another life, I was in the little room next to the kitchen with boot blacking up to my elbows. (this an-

swers a lot of questions Ken, Ed.).

4. **LIGHT PULLS** hang from the ceiling and turn the light on and off when pulled. If your hands are dirty it is up to you; but if you have wet hands you are safe from electric shock. I have two light pulls, one from Ann Norman (well I have three, Ken, Ed.), and one from Glad Findley (ok, I don't have one of them yet, Ed).

5. **MILLENNIUM BELL ROPES**, read the "Inter Knot 2000 and Beyond" notes, when they come out.

(It's about time someone caught one of my 'DELIBERATE MISTAKES'. I make enough of them. Ed)



### **ANORAKS !!**

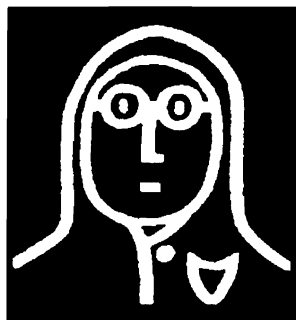
Paraphrased from a recent newspaper article; 'Anorak: A club you should be seen at.'

The **mission** of the IGKT is to evangelise the art, craft and science of knotting: and to chart the thousands of knots. The **perks** are meeting other strange people and getting knotted in ones and two's as well as in groups. The **dress** is off-duty scoutmaster. Anoraks or blazers

with a Guild tie knotted perfectly (with running knot motif) and lengths of coloured string draped around the neck for quick access. Turks Head bracelets or woggles. Females may wear earrings made of a series of knots that form a miniature bellrope. **Leading Lights** : Professor Vaughan Jones who uses knotting in maths to unravel the basis of DNA; Harry Asher (uncle of Jane); Erik Franklin, knotting columnist for the Scout Association's magazine.

### **Distinguishing Features:**

Long pieces of string, or other yarn, draped fashionably about their person, one end with a series of amusing half-started knots. **Best Club Joke**: "Are you a piece of string? No I'm a frayed knot!" Er ...



## SIX KNOT CHALLENGE

by Richard C. Hopkins  
Bristol, England

The purpose of this article is to explain the rig I use for the Six Knot Challenge, tell you how I arrived at my present set up, how it is operated and ask for suggestions to improve it.

Over the years, much has been mentioned about the Six Knot Challenge and the way in which the record in the Guinness Book of Records was achieved. According to our New Zealand Branch, a four knot version has been introduced there and I have discussed the set-up with many people from various places around the world.

For new members, the challenge consists of tying the six basic Boy Scout knots, using six different cords, as fast as you can against the clock. The knots are reef knot, sheet bend, sheep-shank, clove hitch, bowline and round turn and two half hitches. According to the Guinness Book of Records the fastest time was achieved by Clinton R. Bailey Snr., of Pacific City, Oregon on 13th April 1977. He

took just 8.1 seconds! This is quite quick. You try it. Details of the timing technique used and arrangement of the cords seem to be no longer available.

I had read of the challenge in KM but first met it in the flesh at a three day meeting at Farnham a few years ago when I was persuaded by Ken Yalden to help run his rig. It was a busy time as some Sea Cadets were very competitive and returned time after time in an attempt to become the local champion.

When I returned home I set up my own rig on a similar lay-out and later operated in parallel with Ken at the Tall Ships Race in 1994, running a competition between the ships crews. This also was hard work but brought a fastest time of 16.5 seconds and also a blindfold time of 18 seconds.

The Challenge is a good competition and if the audience is suitably minded it can be quite exciting. however at most of the events I have attended, people are reluctant to try to "beat the clock" because they feel that their time will be embarrassingly far from the Guinness time.

This is where it becomes hard work. The rig acts as a great eye-catcher and is excellent to draw the passers-by towards the display, it requires determined effort to attract a "victim". When one person is standing still and listening to you, or asking a question, they act as a magnet to others and a small crowd can collect to hear all about the Guild and try to tie a few knots. It helps to be able to give a length of cord to customers to take away "for practice". It need only be cheap stuff but acts as reinforcement to what they have been told about the Guild, especially when this may be the only "hands-on" exhibit in the show (as was the case at Bristol last year) and thus they can gain a sense of achievement at mastering a knot that has eluded them for many years. This is frequently the bowline.

The Challenge will not, in most cases, act as a stand alone item (unless the crowd are already knotters) but is perfect to draw people in to the rest of a display. Perhaps this is why I found myself stationed outside a tent in the rain at Penzance

when the rest of the show was under cover.

Now for detail about the rig. The illustration will, I hope, explain any awkward parts of the text. Any distortion in the picture is caused by the angle at which the original photo was taken, from which I traced the drawing, you can tell that I am no artist. It may be of interest to know that the whole rig, dismantled, fits in the boot of my car, except for the long pipes which go beside the passenger seat.

The basis of the rig is a Black and Decker Workmate but anything sturdy can be used. In the vice jaws I have a piece of 4 inch by 2 inch timber, four feet long. Near each end is a hole sized to accommodate plastic water pipes (1  $\frac{1}{4}$  inch). These are a tight fit and are spaced to come outside the jaws of the Workmate.

These plastic pipes are about six feet long and go down to the ground where they fit into tight holes in another piece of wood (4 x 1 inch). The tops of the pipes are joined by another piece of the same size pipe using push-on right angle bends.

The rectangle thus formed is fairly rigid.

At a convenient height, about five feet from the floor, a four inch long eyebolt goes through each upright pipe. They stop the cross rope from sliding down the pipes and the projecting bolt shaft provides a place for a clove hitch when made by flipping two loops. The shaft is covered with a bit of plastic tube to prevent the exposed thread from cutting the cords.

The laid cross rope is one inch diameter and has an eye splice at each end made to fit fairly tightly between the uprights. Some slack can be taken up by twisting the rope but it is best to get the eyes in the correct position at the start. Possibly this rope could be removed and the top bar lowered using shorter side pipes but it feels good and emphasises the rope work theme.

For my own convenience I have clamped a piece of plywood (using G-clamps) to the back shelf of the Workmate to extend the space available. The stopclock and holders for publicity brochures stand on here in relative safety.

My six Challenge cords are six feet long of a soft braided nylon around 8 or 9 mm diameter, although Ken uses a rather stiffer, thinner cord. Almost any reasonable cord can be used but the cheaper laid ones tend to come apart. The ends are cut with a hot knife and thus sealed. In addition I keep a few spare cords, as it is not unknown for a cord to disappear when the stand is busy. One or two 9 foot lengths are also handy for some demonstration, especially the one handed bowline around my waist. (And, No, I am not that fat.)

Along the length of the wood, underneath the cross rope but not shown in the drawing to prevent clutter, I have a picture of each of the six knots, drawn in waterproof ink and laminated in plastic, with their names in English, German and French. The knots are shown loosely tied, i.e., not pulled tight, to aid the memories of contestants and act as a guide when showing beginners what to do. The pictures are then taped to the 4x2 as they will otherwise get knocked off by the rope ends or even taken as souvenirs.

Finally, there is a score board with space to add the name of the best performer of the show, and the time achieved. China-graph pencil or a dry wipe pen is useful as the time will probably need to be changed several times if there is a competitive spirit present.

Pictures of the knots are shown on the scoreboard as people often look at this before making an effort to approach the stand. As can be seen my scoreboard fits under the front bar of the Workmate, thus giving concealment to the small crate in which the various components and spares are carried and which fits beneath the stand when in operation. A large plastic bag protects the contents from the rain, sand and dust.

You will notice that I have added a ringbolt at each end of the main crossbar and a small pin or bollard . These have been provided to make it easier to demonstrate other knots. Frequently I have been asked about mooring small boats, and it is much easier to demonstrate on something that looks familiar to the questioner, rather than hope that the blank expression greet-

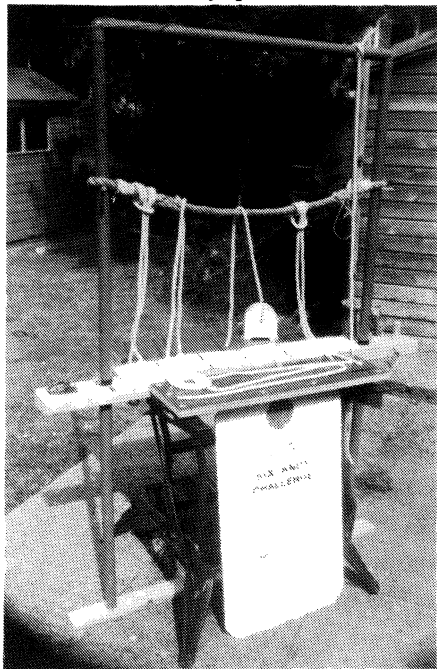
ing your best efforts at communication and explanation indicates comprehension. It seems to work, and when they subsequently practice, they form the focus for the next group of passers-by, who can then be persuaded to stop, listen and learn.

Useful additions to the spares crate are boiled sweets or throat lozenges and a supply of soft drinks or coffee, although if you have a good crowd, there may not be time to drink very much , as you are talking for most of the day. However, listening to the “customers” is essential, because even though you hear the same problem, or joke or memories of the Guides, Scouts, Navy etc., time after time, occasionally you hear a little gem or learn a new technique that makes the day stand out in your memory.

Obviously a stopwatch or stopclock is required and if the challenge is likely to approach the record, two independant timekeepers will be needed. Further details of the rules can be obtained from the Guinness Book of Records if you decide to make a serious attempt at the

title. I use a stopclock because everyone can see what is happening, and also because stopwatches always break down on me, especially the electronic variety.

Other items for the crate include note book and pen or pencil, Guild publicity brochures, give away lengths of cord, tissues to wipe the china-graph off, and even a copy of the Guinness Book of Records to show doubting customers. Old copies can be found very cheaply at charity shops or car-boot sales. Only post 1977 edi-



tions of course.

Now for the operation of the Challenge. This is my own way of working, based on Ken Yalden's system and seems to work effectively. Tie the six knots in the six cords as quickly as possible. There are no hard and fast rules. Practice is a great help and is useful for each contestant to work out how they want to position the cords.

It has been found that if the challenge cord is middled and tied over the cross rope, (as on the extreme left cord in the illustration) the ends may be grabbed quickly without fumbling, and time can thus be saved when tying the reef knot and the sheetbend. For the sheetbend it may be easier to have the ends of different length but personal preference will show at the practice sessions.

A cord tied to the top bar and hanging down, possibly with the end on the 4x2 or the bench top, can speed the bowline, while there is no objection to a cord already resting across the cross-rope before starting the round turn and two half hitches.

The clove hitch can be formed around the cross rope, in which case it starts by resting across



the rope, or it may be dropped over the bollard pin or a projecting end of the eye bolts in the pipes when it could start or be resting anywhere convenient.

The sheepshank may be tied in different ways and the layout for each is different but a fast method using the idea of the truckers dolly knot will benefit from one end of the cord being fixed to the top bar as with the bowline.

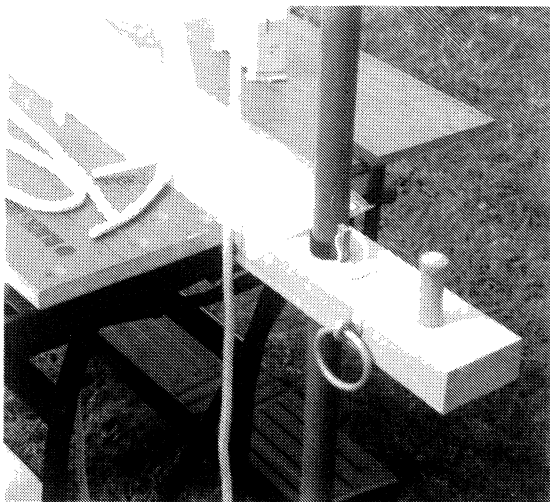
The competitors do not have to use the rig, and can tie knots in their hands rather than hang cords from the cross rope if that is how they feel most comfortable.

For the purposes of the competition only, I do not insist on long enough ends to prevent things coming undone under strain, although it is best if the knot holds together until the end of the challenge attempt.

Every attempt is made to help competitors, none of whom would ever consider cheating, but careful control must be in evidence to prevent creative reduction of the challenge time, such as pre-forming loops for the clove hitch or sheepshank.

The clock is started as the competitor makes the first move, although the ends of the cords can be in the hands, and it is stopped as the last knot is completed. When pressure is tense I turn the clock away from the competitor to prevent distraction. It is sometimes concealed from the audience if they become too vocal in support or detraction from the competitor who must always be given every encouragement.

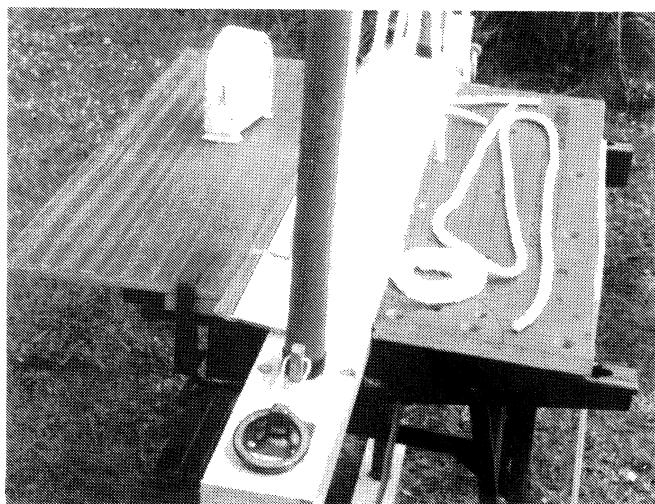
Finished knots may be dropped on completion, they need not be placed down before grabbing the next cord. This applies mainly when knots are tied in hand and especially for



the sheepshank which is often left until last.

As mentioned earlier, it can be hard work running this challenge, both in attracting the attention of passers-by and in dealing with the questions that are asked. It helps to know more than one way to tie each of the knots, several uses for each one and wide ranging, if sketchy, knowledge of several different aspects of knotting as you will be asked questions that cover almost every use of cordage.

Inevitably you will be asked what your best time is. It is useful to have a reasonable answer, but you can always say that you have been too busy to attempt it yourself.



Then you have to be able to put off offers to operate the

clock while you show them how to do it. A gift of the gab is useful to attract customers, but essential when making excuses.

It is not unusual for someone to start at 90 seconds and rapidly (after only 2 or 3 attempts) to have reduced their time to about 30 seconds. This is when the tension mounts, and the excitement builds up as seconds are pared from the score. This can also be the time that someone takes one of the cords "to show my wife how to tie up the boat" and your attention must cover the whole crowd as well as focusing on the clock. A second helper can be a godsend. A large number of information

brochures can be handed out each day so the Challenge is a good and enjoyable way to spread the word about the Guild.

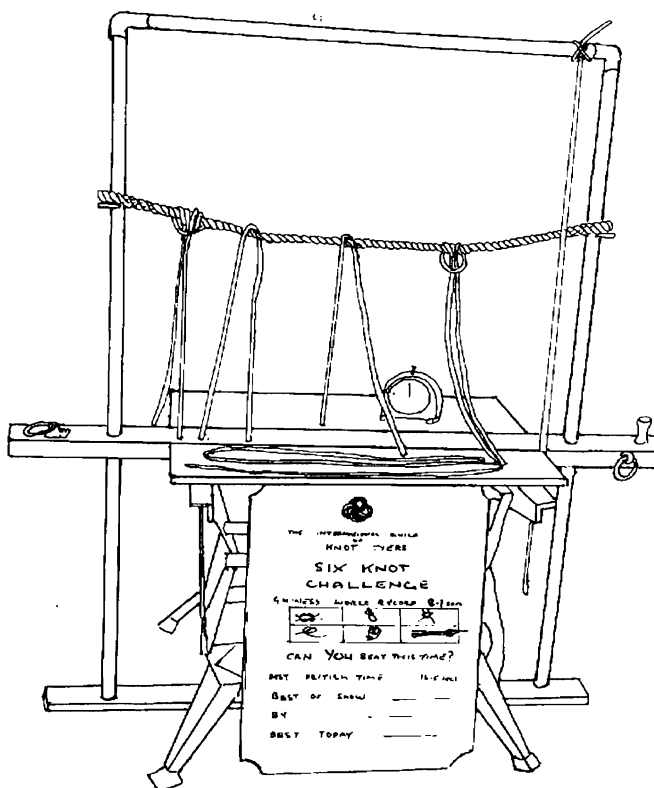
Although I do not charge, comments from members of the public suggest that if run on competitive lines, at say, 20p a go, the challenge could be a useful fund-raiser

that is not expensive to construct. The workmate can revert to do-it-yourself when not on duty.

In conclusion, I would like to remind you all that there is no copyright on the rig shown, thoughts expressed are my own views and although this system works well for me you may wish to adapt it. Thanks are due to Ken Yalden for giving me the idea and to countless contestants for their comments, (well,

the helpful ones anyway). If you can suggest alterations or developments to beat the record or make the rig a more versatile teaching tool, I would be delighted to hear from you.

I hope that this article will have explained the idea of the Six Knot Challenge and will help those wishing to set up a challenge for their own branches, wherever they are in the world.



## **NARROW BOAT "DECORATIVE" ROPEWORK**

by Mr. Alf Langford

First let me say that there is no "DECORATIVE" rope work on a canal narrow boat. All rope work on the narrow boat has a practical purpose, with one exception, "The Swans Kneck" which I will explain in my last paragraph.

The boats (not Barges) usually work in pairs, a motorized boat (the motor) towing a dumb boat (the butty) and both of them have rope work made from white cotton rope on them.

The following paragraphs explain the practical uses of the rope work.

### **CRATCH ROPES**

At the forend of both boats is the cratch, a tent like structure slotted together from wooden slats, covered with canvas and the whole held rigid by 2 or 3 ropes passed back and forth over the top. The end is then coiled into a small wheel and tucked under itself.

### **MAST DROPPER**

**(Whores Knot or Donkeys C--k)**

The common name of the Mast Dropper becomes apparent from, it's appearance. It looks like a large bell rope but with a knob instead of a tassel.

The Mast Dropper hangs on the mast box which houses the adjustable mast, facing the stern. It's purpose being, should the Mast Box break free, we are led to believe, it would fall towards the stern, and the mast dropper acts as a fender, protecting the bright paintwork on the Mast Box.

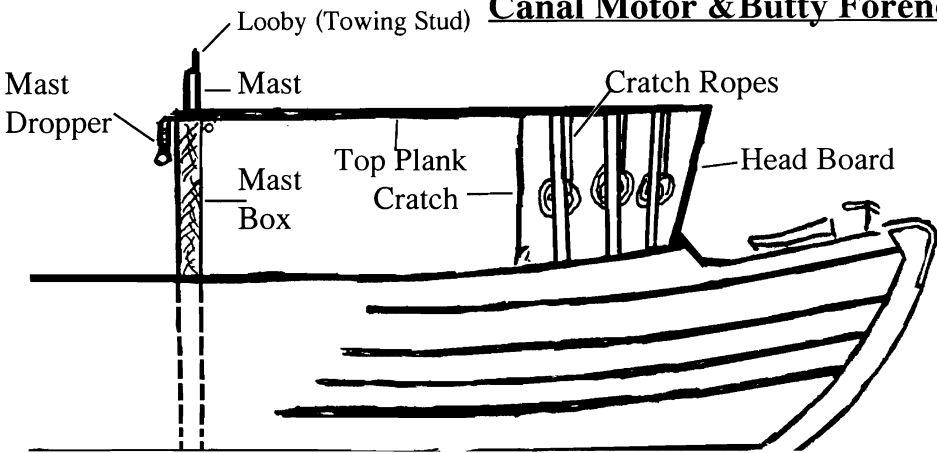
### **SIDE STRINGS (Can or Chimney Strings)**

These are simply made from a length of boatline, which is crowned back at both ends for about 18".

The purpose is to protect the cabin side. The fresh water cans sit on the cabin top in front of the chimney The can strings are fastened to the cabin top and passed through and around the can handles, it is then draped over the side.

If the chimney or cans get dislodged they would (we hope) fall on the strings and not the cabin

## Canal Motor & Butty Forend



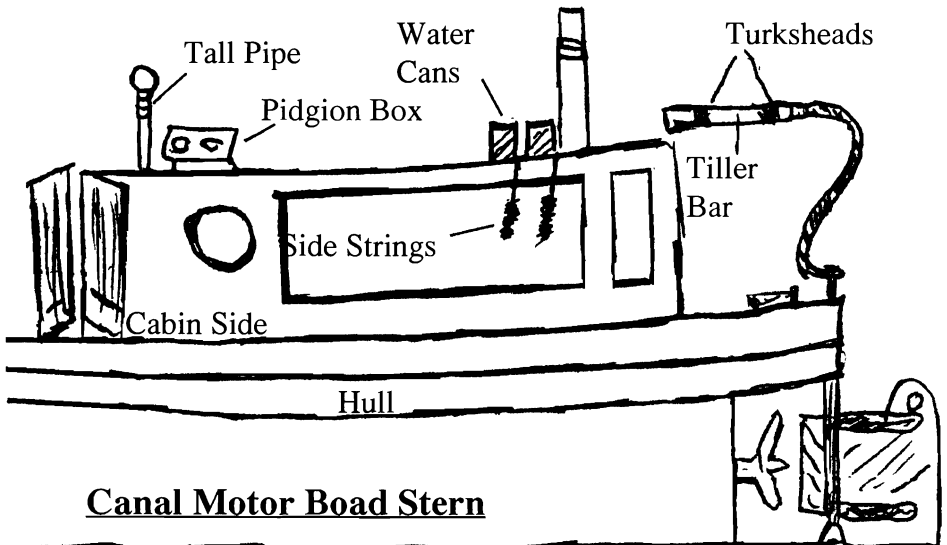
sides. They also provide a security feature by preventing the cans from being lost.

### REMOVABLE TILLERS

Both the motor and the butty tiller have turks heads worked around them at intervals.

the purpose being, both tillers

have to be taken out and placed on the cabin top when working through a lock. The cabin top of a well kept boat was usually grained and clear varnished. The Turks Heads acted as fenders, to protect the polished surface.



## Canal Motor Boad Stern

## THE BUTTY RUDDER

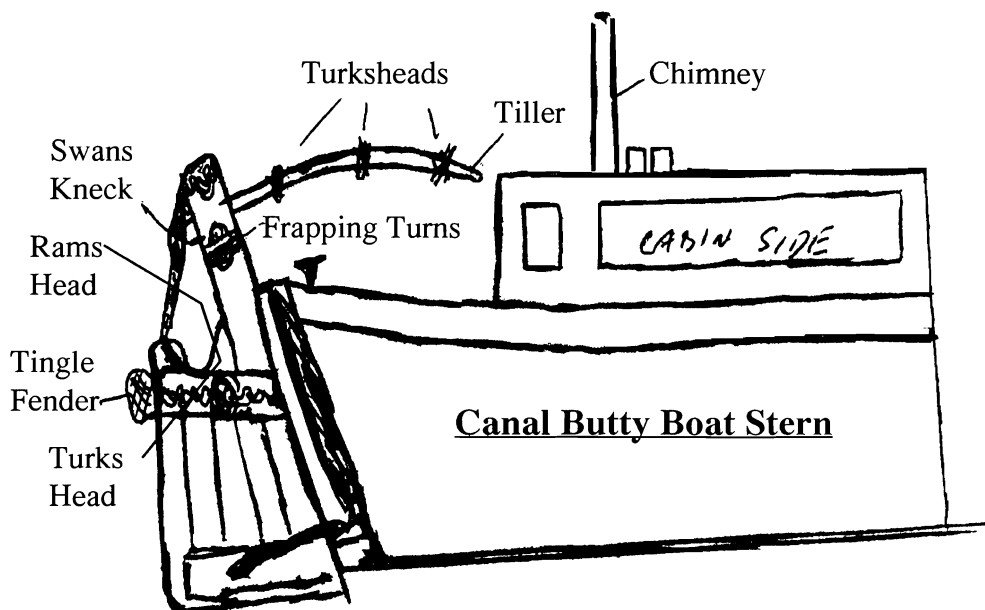
This has more white rope work than anywhere else on the boat. There are three and five part Turks Heads and Frapping Turns. The Rudder Post (Rams Head) has a Turks Head as close to the top as possible.

The Tingles (wooden blocks on the rudder blade) have either frapping turns or a three part turks head, with the ends turned in a wheel and tucked under, and a small fender usually a five part Turks Head worked into a ball is placed on the tingles.

The purpose of the Tingle Fender is obvious that it protects the back edge of the rudder blade.

The Turks Heads need more explanation. When working narrow locks, the rudder is pulled around to lie along side the stern, this throws the top of the Rams Head back and if the boat surges it would strike the gate. The Turks Head acts as a fender to absorb the blow.

The Turks Head or frapping turns on the Tingles act as chafing gear between the rudder blade and the side of the boat.



## **THE SWANS NECK**

I have never managed to find a practical reason why this rope work came about, despite many enquiries, I have however formulated theories of my own, I must stress that my ideas are theory not fact.

My first theory is that a metal or wooden stay to strengthen a rudder was covered in rope. To be a decorative feature.

My second theory and the one

I like to think is the correct version is:- when canal transport first started, the boatmen lived on the bank and like other country people they had corn dollies to keep away any bad spirits. I think that when they moved onto the boats they took their corn dollies with them, and that this developed into the Swans Neck. This is just guesology and I could be completely wrong.



**A motor and butty being enjoyed by holiday makers.**

# TURKS HEAD KNOTS AND THE RULE OF THE GREATEST COMMON FACTOR

by Jesse Coleman, Alabama,  
USA.

Many books on knots state that in order to tie a turks head knot, the number of bights and the number of leads must be relatively prime. That is, these two numbers must have no common divisors. Ashley called this the "Law of the Common Divisor" and wrote that this applies to TH knots tied using only one cord.

We will examine how many cords are required to tie a TH knot with any number of bights and leads. All you'll need is some paper and a pencil with an eraser.

We'll illustrate drawing TH knots with 4 bights and 2 or more leads. Start with a square, extend the lines past the corners, choose an over-under pattern and join the lines, as shown in figure 1.

This is a drawing of a 4Bx2L TH knot and it requires 2 cords to tie. Now we extend this 4Bx2L TH into a 4Bx3L TH

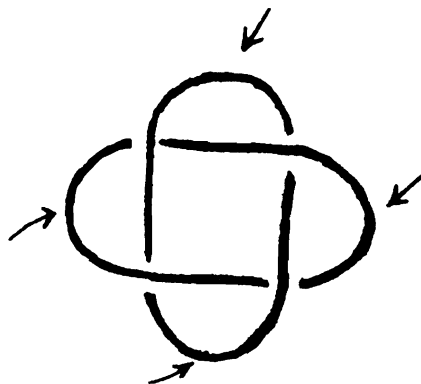


Figure 1

knot. Erase the lines, representing the outer part of the outer bights, shown by the arrows in figure 1. Extend the lines, preserving the over-under pattern as shown in figure 2.

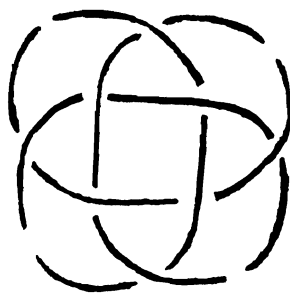
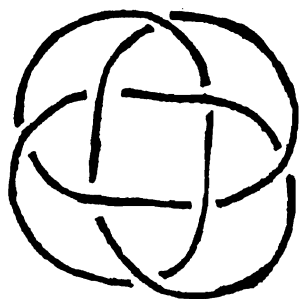


Figure 2

If the lines are joined (figure 3) we have a drawing of a 4Bx3L

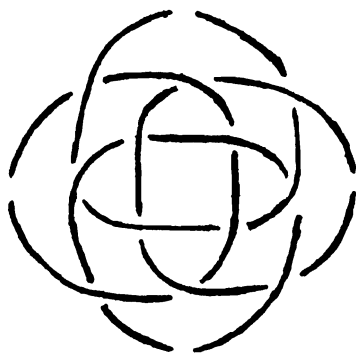


TH knot that requires only 1 cord to tie.



*Figure 3*

Returning to figure 2, the lines may be extended once more (figure 4)

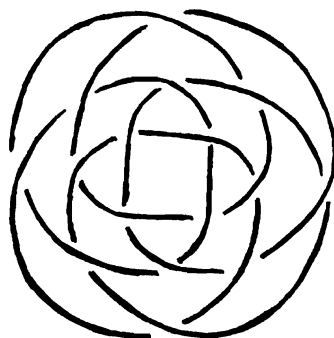


*Figure 4*

If they are closed into bights then we have a drawing for a

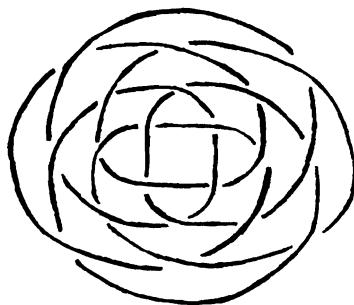
4Bx4L TH that requires 4 cords to tie.

This process can be extended until your paper or patience run out. Figure 5 is a 4Bx5L TH knot that requires 1 cord to tie.



*Figure 5*

Figure 6 is a 4Bx6L TH knot that requires 2 cords to tie. Feel free to add more leads if you want to draw them. After each lead is added, follow the lines and see how many separate



*Figure 6*

cords are needed to tie that particular TH knot.

Start with a square if you want to make TH knots with 4 bights. You could start with a 2 sided figure for TH knots with 2 bights. After the first extension, this would resemble Ashley's figure 2203. Or you could start with a figure with any number of equal sides. The number of sides of this initial figure will be the number of bights in the resulting TH knots. The number of leads may be increased without limit using this method.

Having made many such drawings, I arrived at this rule: The number of separate cords required to tie a turks head knot with B bights and L leads is the greatest common divisor of B and L. Let's call this the Rule of the Greatest Common Divisor.

So what's a divisor and what's a greatest common divisor. Suppose we wish to tie a 9Bx6L TH knot. Nine can be divided by the whole numbers 1, 3 and 9. So that the integer factors of 9 are 1, 3 and 9. That is,  $1 \times 9 = 9$  and  $3 \times 3 = 9$ . Six has factors 1, 2, 3 and 6. The largest number in both of the two sets of numbers (1,3,9) and (1,2,3,6) is 3. Therefore 3 is the greatest common factor of 6 and 9. Thus, 3 cords are required to tie a

9Bx6L TH knot and also a 6Bx9L TH knot.

Suppose we wish to tie a 4Bx5L TH knot. The Law of the Common Divisor says that this may be tied using one cord. The factors of four are 1,2 and 4. The factors of five are 1 and 5. The largest number in both sets of numbers (1,2,4) and (1,5) is 1. Therefore a 4Bx5L TH knot may be tied using only one cord. Thus, the Law of the Common Divisor is a special case of the Rule of the Greatest Common Factor.

Multiple cord TH knots are very attractive when tied in cords of contrasting colours. The different colour patterns spiral along the length of the TH knot in a "barber pole" fashion.

In a table printed just after his knot number 1314, Ashley listed all combinations of bights and leads that are possible for a TH knot tied with one cord for knots with not more than 24 bights and not more than 40 leads. In the attached table, I list the number of cords required to tie TH knots that have not more than 24 bights and 40 leads. For each entry in this table that is greater than one, Ashley placed an X in the corresponding position, indicating that the knot could not be tied with one cord.

# The Number of Separate Cords Needed to Tie Turks Head Knots of Not More Than 24 Bights (Columns) and 40 Leads (Rows)

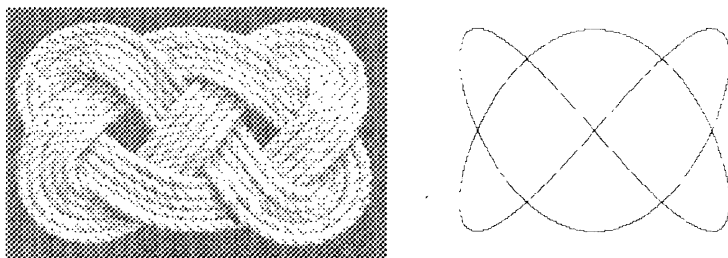
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
2	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
3	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3	1	1	3
4	2	1	4	1	2	1	4	1	2	1	4	1	2	1	4	1	2	1	4	1	2	1	4
5	1	1	1	5	1	1	1	1	5	1	1	1	1	5	1	1	1	1	5	1	1	1	1
6	2	3	2	1	6	1	2	3	2	1	6	1	2	3	2	1	6	1	2	3	2	1	6
7	1	1	1	1	1	7	1	1	1	1	1	1	7	1	1	1	1	1	7	1	1	1	1
8	2	1	4	1	2	1	8	1	2	1	4	1	2	1	8	1	2	1	4	1	2	1	8
9	1	3	1	1	3	1	1	9	1	1	3	1	1	3	1	1	9	1	1	3	1	1	3
10	2	1	2	5	2	1	2	1	10	1	2	1	2	5	2	1	2	1	10	1	2	1	2
11	1	1	1	1	1	1	1	1	1	11	1	1	1	1	1	1	1	1	1	1	1	1	1
12	2	3	4	1	6	1	4	3	2	1	12	1	2	3	4	1	6	1	4	3	2	1	12
13	1	1	1	1	1	1	1	1	1	1	1	13	1	1	1	1	1	1	1	1	1	1	1
14	2	1	2	1	2	7	2	1	2	1	2	1	14	1	2	1	2	1	2	7	2	1	2
15	1	3	1	5	3	1	1	3	5	1	3	1	1	15	1	1	3	1	5	3	1	1	3
16	2	1	4	1	2	1	8	1	2	1	4	1	2	1	16	1	2	1	4	1	2	1	8
17	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17	1	1	1	1	1	1	1	1
18	2	3	2	1	6	1	2	9	2	1	6	1	2	3	2	1	18	1	2	3	2	1	6
19	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	19	1	1	1	1	1	1
20	2	1	4	5	2	1	4	1	10	1	4	1	2	5	4	1	2	1	20	1	2	1	4
21	1	3	1	1	3	7	1	3	1	1	3	1	7	3	1	1	3	1	1	21	1	1	3
22	2	1	2	1	2	1	2	1	2	11	2	1	2	1	2	1	2	1	2	1	22	1	2
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	23	1	1
24	2	3	4	1	6	1	8	3	2	1	12	1	2	3	8	1	6	1	4	3	2	1	24
25	1	1	1	5	1	1	1	1	5	1	1	1	1	5	1	1	1	1	5	1	1	1	1
26	2	1	2	1	2	1	2	1	2	1	2	13	2	1	2	1	2	1	2	1	2	1	2
27	1	3	1	1	3	1	1	9	1	1	3	1	1	3	1	1	9	1	1	3	1	1	3
28	2	1	4	1	2	7	4	1	2	1	4	1	14	1	4	1	2	1	4	7	2	1	4
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
30	2	3	2	5	6	1	2	3	10	1	6	1	2	15	2	1	6	1	10	3	2	1	6
31	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
32	2	1	4	1	2	1	8	1	2	1	4	1	2	1	16	1	2	1	4	1	2	1	8
33	1	3	1	1	3	1	1	3	1	11	3	1	1	3	1	1	3	1	1	3	11	1	3
34	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	17	2	1	2	1	2	1	2
35	1	1	1	5	1	7	1	1	5	1	1	1	7	5	1	1	1	1	5	7	1	1	1
36	2	3	4	1	6	1	4	9	2	1	12	1	2	3	4	1	18	1	4	3	2	1	12
37	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
38	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	19	2	1	2	1	2
39	1	3	1	1	3	1	1	3	1	1	3	13	1	3	1	1	3	1	1	3	1	1	3
40	2	1	4	5	2	1	8	1	10	1	4	1	2	5	8	1	2	1	20	1	2	1	8

# Cylindrical Chains<sup>1</sup>

In my last article "*The old art of rope work and modern signal processing*" I discussed the relationship between Lissajous figures, rope mats and signal analysis. In this article I will discuss how these methods can be used on 3-dimensional knots and *Cylindrical chains*<sup>2</sup>.

## Cylindrical Turk's Head chain

I have in my last article showed how a rectangular mat is equivalent with a two dimensional Lissajous figure.



**Figure 1 Rectangular mat realised with rope (left). Same mat simulated on a computer (right)**

A rectangular mat can be simulated on a computer by two cosine function. The number of bight along the two sides shows the ratio between the two frequencies involved.

$$x = A_x \cdot \cos(2 \cdot \pi \cdot f_x \cdot t + \varphi_x) \quad (1)$$

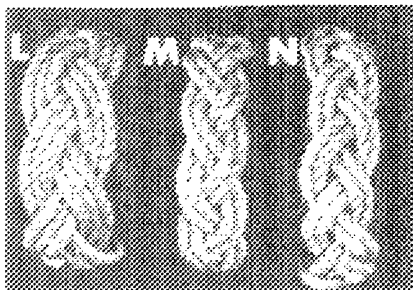
$$y = A_y \cdot \cos(2 \cdot \pi \cdot f_y \cdot t + \varphi_y) \quad (2)$$

$A$  are the amplitudes,  $f$  the frequencies and  $\varphi$  the phases. For the rectangular mat in Figure 1 the frequency values are  $f_x = 2$  and  $f_y = 3$ .

- 
1. Author: Nils Kristian Rossing, Bromstadekra 11 B, 7046 Trondheim, Norway.  
e-mail: nils.k.rossing@informatics.sintef.no
  2. In this article I have consistently used the term "Cylindric Chain" of models made by me.  
However a more official name would be "Cylindric braids".

We can now introduce a third harmonic function in the z-direction. This gives us a 3-dimensional mat or knot. It is not surprising that this gives a Turk's Head knot.

Figure 2 shows some examples fetched from Kaj Lund's book: "Toværks kunst".



**Figure 2 Three 3-strand Turk's Head (Kaj Lund)**

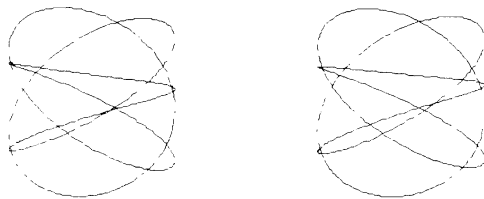
Turk's Head can be simulated by means of the following equations:

$$x = A_x \cdot \cos(2 \cdot \pi \cdot f_x \cdot t + \phi_x) \quad (3)$$

$$y = A_y \cdot \cos(2 \cdot \pi \cdot f_y \cdot t + \phi_y) \quad (4)$$

$$z = A_z \cdot \cos(2 \cdot \pi \cdot f_z \cdot t + \phi_z) \quad (5)$$

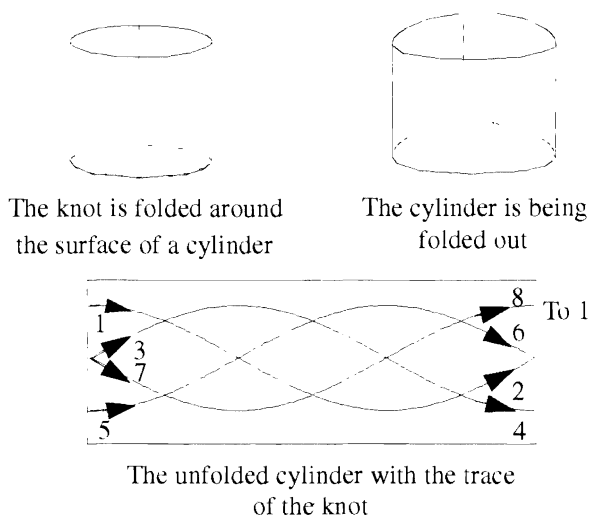
For the Turk's Head in Figure 2 the three frequencies are  $f_x = 4$ ,  $f_y = 4$  and  $f_z = 3$ .



**Figure 3 Stereoscopic view of a 4-strand Turk's Head with 3 bights**

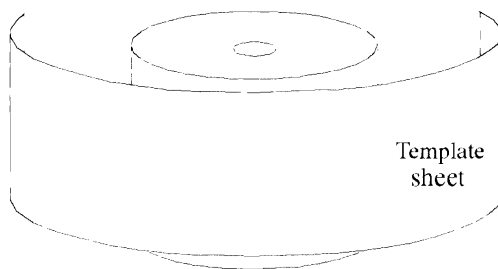
To obtain a cylindrical knot,  $f_x$  had to be equal with  $f_y$  which also is the number of strands and  $f_z$  gives the number of bights. In the same way it is possible to simulate a Turk's Head of any strand and number of bights.

A more suitable way of representing the knot when it shall be realised with rope is to fold it out as shown in Figure 4.



**Figure 4 Unfolding the pattern is a more suitable way of representing the simulated knot**

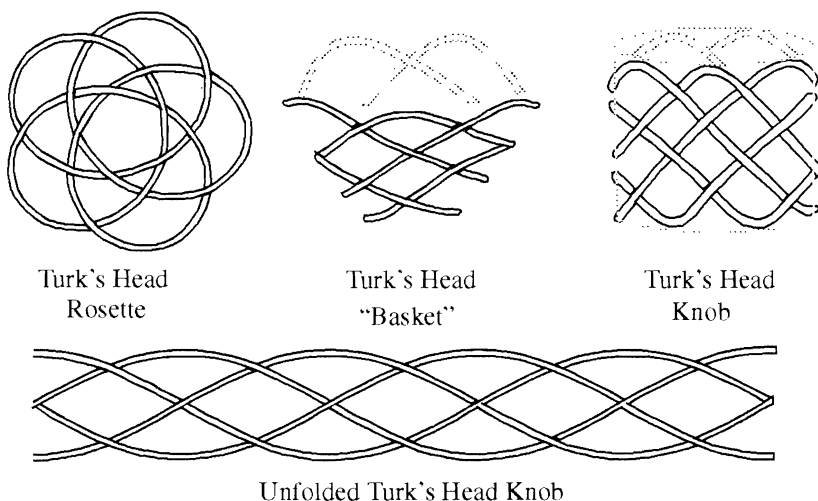
The unfolded simulated pattern shown in Figure 4 is suitable as a template for making the real knot. By scaling the pattern it can be fitted to a suitable cylinder as shown in Figure 5.



**Figure 5 Template sheet is folded around a suitable object**

The Turk's Head can be looked at as a Turk's Head rosette which is folded up from its original 2-dimensional shape to a 3-dimensional shape.

This is illustrated in Figure 6 below.

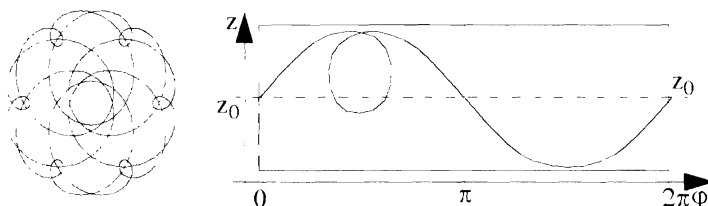


**Figure 6 The Turk's Head Rosette folded up to a Turk's Head Knob**

An interesting question is if a Simple Eye rosette can undergo an equivalent transformation.

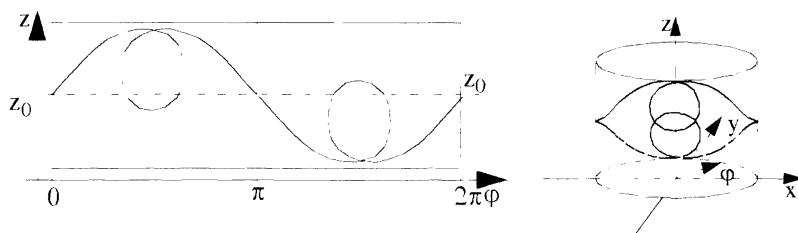
### Simple Cylindric Eye chain

A Cylindric chain is a braid surrounding a cylindrical body. In my terminology every cylindrical chain consists of one or more *basic figures*. Each figure linked together with the next one, winding up around the cylindric body.



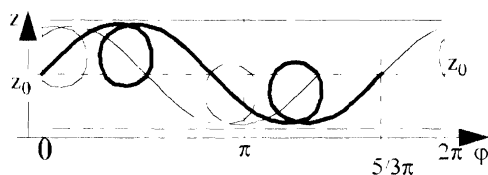
**Figure 7 The Simple Eye rosette and the rosette *basic figure*.**

However, the basic figure shown in Figure 7 makes a chain (or braid) which is not symmetrical. Therefore, I will modify the lower part of the basic figure. The resulting basic figure is shown in Figure 8.



**Figure 8 a) Modified basic figure of the Simple Eye rosette and  
b) basic figure wrapped around the cylindric body**

We can now wrap this basic figure around a cylindric body as shown in Figure 8 b). However, wrapping *one* basic figure around the cylinder is not very exiting. If we shrink the basic figure in its longitudinal direction, the figure will not reach total around the cylinder. We can, however, add more basic figures until we reach the first one. If we shrink the basic figure length to  $2/3$  of the cylinder circumference, we need 4 basic figures to reach to the beginning of the first figure. To get a better impression of the chain we can split up the cylinder and unfold it as shown in Figure 9.



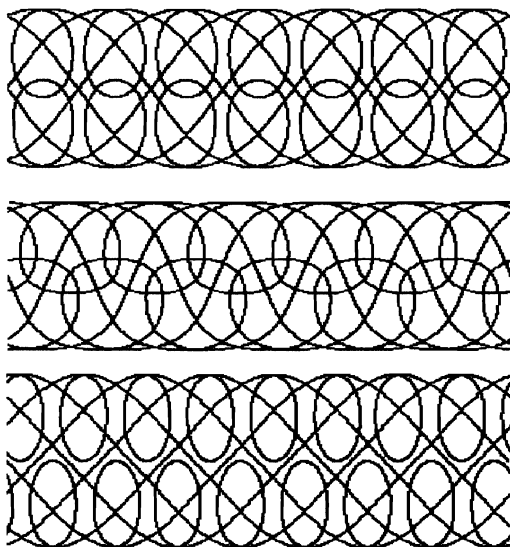
**Figure 9 Two basic figures linked together**

As we can observe from Figure 9 we need two more basic figures to reach back to the beginning of the first basic figure.

To make a total mathematical description of the chain we can find the spectrum of the basic figure. When we have found the spectrum of the basic figure, we can generate the curve describing the figure and we have got a tool to experiment visually with this kind of models.



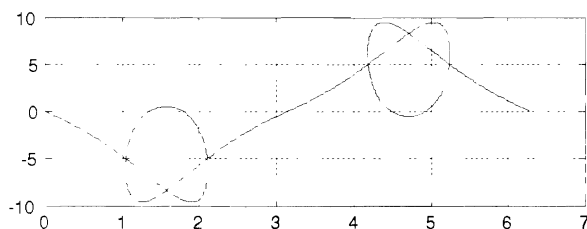
Figure 10 shows three variants of the Simple Cylindric Eye chain.



**Figure 10 Three examples of Simple Cylindric Eye chains**

### **Cylindric Twisted chain**

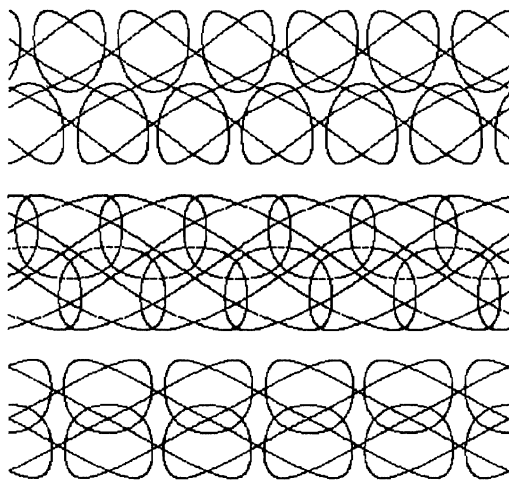
The symmetrical basic figure for the Cylindric Twisted chain has its basis in the overhand knot and has its equivalent in the Twisted rosette.



**Figure 11 Basic figure for the Cylindrical Twisted chain**

By shrinking the basic figure, linking several figures together and manipulating parameters of the basic figure, we can construct several different Twisted chains.

Figure 12 shows some examples.

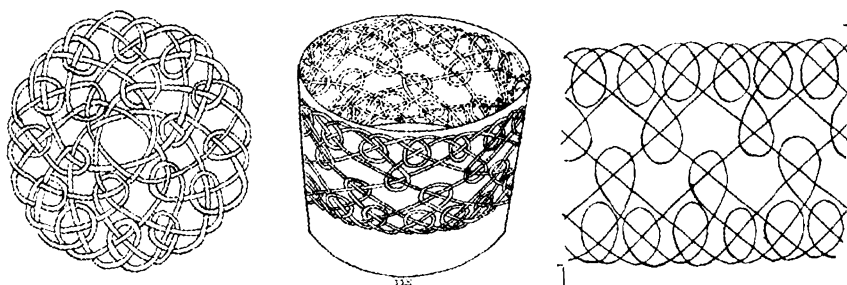


**Figure 12 Three example of the Cylindric Twisted chain**

All the examples shown in this article can be realised by rope. The models can be expanded to the correct format by a copy machine with zoom. Before fastening the template to a cylinder it is smart to mark the crossings (over/under).

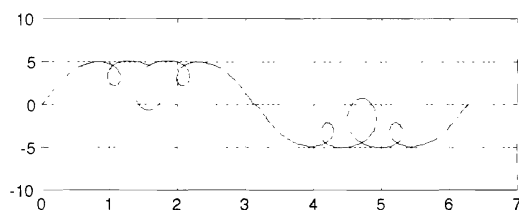
### **Cylindrical Jens Kusk Jensens chain**

P.P.O. Harrison mentions a cylindric braid based on the Jens Kusk Jensens rosette in his book<sup>1</sup>. The following figures are fetched from this book.



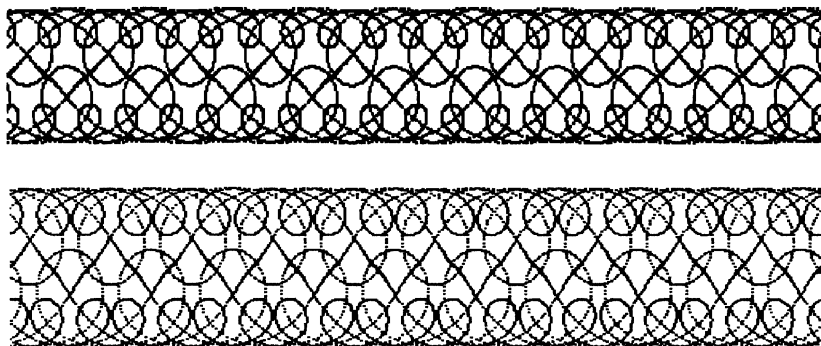
**Figure 13 The Cylindric Jens Kusk Jensens braid (Harrison)**

The basic figure of this braid is shown in Figure 14.



**Figure 14 Basic figure of the Cylindric Jens Kusk Jensens chain**

Using several basic figures linked together we can construct some variants of this cylindric chain. Two examples are shown in Figure 15.



**Figure 15 Two examples of the Cylindric Jens Kusk Jensen Chain**

I hope these models will inspire you to realise some of them with rope. Up to now I have only realised one of these models, a Cylindric Twisted chain, in rope. A piece of cylindric wood, expanded polyester or cork would be suitable for fastening the template with needles. It is important that the template fits the cylinder exactly. I will recommend rope with a diameter of 4 - 6 mm doubled 3 or 4 times.

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1. P.P.O Harrison, Master Mariner, "The Harrison Book of knots", Brown, Son & Ferguson, Ltd. 1964 - 1993.

# THE PREHISTORY OF KNOTS

## When, How and Why Knotting Might Have Started

*Charles Warner, Australia, and Pieter van de Griend, Netherlands*

### PART 1: They Surely Must Have Had Knots

#### INTRODUCTION TO THE SERIES

No one will ever know just when the first Reef Knot or Clove Hitch was tied, unless someone invents a time machine. Knots and the materials in which they are made disintegrate very readily and do not form fossils. The oldest actual knots known are no more than ten thousand years old, though fragments of cordage have survived nearly twice as long. Yet there is, as we shall see, good evidence for knotting much earlier than that.

We plan to present a series of articles on what we know or can reasonably guess about the development of knotting up to the time when people first started to write about knots.

We start with the indirect archaeological evidence for the use of knots, such as pendants with holes for suspension, or the need for watercraft to travel to places known to have been visited. We also discuss some of the hypotheses that have been presented about the development of the cognitive processes that might have been needed to tie and use knots.

We wanted next to speculate about what the first real knots tied might have looked like, and how and why they

might have been developed, but we found that we were stuck for the words with which to do this. So we first define some words and usages to describe some structures and processes in knotting. We go on to list a number of knots that need only a tuck or two to tie, so that they could have been made by anyone with a bit of cord or similar material in his or her hands.

Archaeological finds less than a few thousand years old sometimes have knotted cordage attached, but these knots and cords have rarely been described by archaeologists in any detail. We discuss a few good reports that have been made and compare the knots tied with our earlier speculations.

Finally, we wonder why there are so many different knots around the world for very similar purposes, and what is meant when we talk of a 'new' knot.

#### INDIRECT EVIDENCE FOR KNOTS

The only evidence we have for the activities of the very early humans and their precursors consists of stones and bones; all other signs disintegrated long ago. Wooden tools were almost certainly made and used long before stone tools

were invented, but the earlier ones have all rotted away long ago. Skeletons show us how big their owners were, how they walked, how much manual dexterity they might have had; skulls show us what sort of food they ate, how large their brains were and just a little about brain anatomy, which can give an indication of cognitive powers. Stone artefacts give us more evidence on the manual dexterity and planning skills of their makers, and tell us something of their ecology.

This evidence, together with what we know of modern apes and modern humans, including those leading lives similar in some respects to those of ancient humans, allows us some idea of how tool use first developed and then influenced and was influenced by changes in cognitive powers. The development of knotting probably showed some common elements with that of stone knapping. Both activities involve manual dexterity and planning ahead and, at least in the more advanced stages, require some sort of mental template of the final product; and both have little value in themselves, only as means to ends, the stone tools to gather and prepare a number of things, the knots and cordage to attach them to other things and use them in constructions.

There has been little study of the cognitive powers needed for tying and applying knots, compared with the studies on the making and using stone tools. Many believe that tool use, intelligence and language share common cognitive and developmental bases, so that studies of the development of language have relevance to that of knotting. Certainly,

there are no fossils of either words or knots, and we must rely on much the same indirect archaeological evidence. In the studies that follow, we have not tried to describe all the differences of opinion about the interpretation of that evidence, but have selected those ideas that seem to us easiest to apply to the development of knotting.

In the rest of this article, it can be taken that the archaeological finds are well-substantiated, though there are sometimes some doubts about dates or the exact species involved, but the interpretations are purely speculative, though based on a lot of experimental research, and may be accepted or rejected as you wish.

## AUSTRALOPITHECINES

Since at the present time all kinds of ape and all humans practice at least some elementary knotting, it seems reasonable to assume that our common ancestors and extinct links also made use of entanglements of some kind. Those links include the several species of *Australopithecus* perhaps 2.5 to 4 million years ago and can be expected to have had some knotting ability. Everything that we know about their anatomy and ecology was ape-like, except that they walked upright. This bipedalism freed their hands for carrying, probing and throwing, and eventually allowed adaptation to tool making and using.

Thus, while the australopithecines may well have tied knots no more sophisticated than those tied by modern apes, it is quite possible that they tied

many more of them. Arthur C. Clarke in *2001: a Space Odyssey* (1968) wrote that the very first thing taught to the 'man-apes' by the crystal monolith from outer space was a knot, long before stone tools, fire or language, and this may well represent the time sequence of events even if not the cause. The australopithecines quite likely started to incorporate knotting into their culture, making entanglements, ambushes, snares and perhaps traps, as well as carrying devices to transport food, useful objects or their infants who would otherwise have trouble clinging to their upright parents.

The use of tools by apes is almost always individual and solitary, whereas in all modern traditional human societies it is predominately social and cooperative. Perhaps apes lack the cognitive powers needed to cope with a division of labour needed for large projects, or with the requirements of cooperative sharing. Maybe the australopithecines were a little better able to share materials or activities than the apes.

### **HOMO HABILIS, THE HANDYMAN**

The first *Homo* species, *Homo habilis*, lived in Africa from about 2.5 to 1.6 million years ago. They had brains a little bigger than their predecessors', and their skulls showed that structures often thought to be related to the ability to use tools and acquire language, Broca's area and neural laterisation, were fairly well developed. There seems to have been a significant amount of meat in their diet, and they may have had a more cooperative society.

They made the so-called Oldowan stone tools, though there are suggestions that the typical chipped cores may have actually been discards after removal of the sharp flakes really wanted. There seemed no need for any mental template of the finished tool, only the technique to produce flakes. By analogy, they probably knew no real knots, but were able only to make crude entanglements with vines or the like, the kinds of thing we call **conglomerates** in the next article of this series.

But the cobbles they chose to produce the flakes were often carried from their source over considerable distances, which seems to show some foresight; perhaps they used skin or bark containers, fastened with knotted creepers or intestines or something.

Two activities have been attributed to them which, if confirmed, would have required knotting. A circle of stones at a habitation site dated at some 2 million years ago was at one time thought to represent a shelter of skin-covered branches held in place by stones and perhaps guys, but it is now thought more likely to be a purely natural association of rocks and stone tools. Many pebbles have been found in several places, plainly shaped into near spheres that were once thought to be stones for bolas swinging on the ends of some cordage, which would have needed some fairly sophisticated knotting, but they are now believed to be mainly well-worn hammer stones.

## **HOMO ERECTUS, THE UPRIGHT MAN**

*Homo erectus* lived between 2.0 and 0.4 million years ago, and was the first hominid to migrate beyond Africa and spread to Asia and Europe. Their brains were significantly larger than for *habilis*, and seem to have expanded gradually throughout their period. Their stone tools, in the Acheulian tradition, were more advanced than the Oldowan but showed remarkably little change in design until near the end of their period. So it appears that the expansion of the brain had little relation to more sophisticated tool use. Four alternative adaptations have been proposed: an increased ability for aimed throwing; an increase in social intelligence, the ability to understand, respond to and manipulate social situations; an ability to cope with the widely different climatic, geographic and biological environments met as they spread throughout the Old World; and a growing lexicon or store of words in a proto-language, thought by some to be a syntax-free pidgin-like language without the profound symbol-manipulating qualities of full language.

The stone core-tools known as Acheulian hand-axes, that changed so little in design for more than a million years, may still only represent discarded cores after production of the wanted flakes, but they show a regularity of design presumably due to better technique. The density of artefacts on the ground and the distances of caches from the sources of the stones increased, presumably due to improved carrying techniques.

Some fossil bones some 1.5 million

years old show cut marks that have been interpreted as due to cutting a carcass to remove skin and tendons rather than meat. It can be postulated that some of the hides, perhaps secured with the tendons, were used to transport tools or meat. An increased brain size probably meant a prolonged period of infant dependency, demanding increased parental care. The upright stance meant that some sort of baby-carrier was probably needed, again perhaps provided by the skins and tendons.

When the erectines appeared in northern China perhaps 1.8 million years ago and in glaciated Europe rather later, they would have found a need for warm clothing and shelter such as would probably have involved knots.

If their culture was as conservative and non-innovative as their stone tools suggest, it is likely that their knots also showed little innovation throughout this long period.

There is no evidence for such knotted things as slings, snares, nets or fishing lines until late in the Paleolithic, less than 20 thousand years ago, but they would have left no traces and it is at least possible that they were already in use even by erectines.

## **LATE ERECTUS, EARLY SAPIENS**

There is a period from about 500 thousand to perhaps 50 thousand years ago when there were several hominid species or subspecies present, some of them stages in the evolution of modern humans, others representing evolutionary dead-ends. They included late *Homo*

*erectus*, Neanderthals, early or 'archaic' *H. sapiens*, and, for some taxonomists, others. During this period new forms of stone tool and other artefacts gradually appeared, some of them plainly requiring some sort of binding material and knots, but it is not always possible to identify the responsible species with certainty, so in what follows we merely describe the artefact or other evidence of cognitive powers without allocating species. In any case, none of the major changes in hominid culture is unequivocally related to the stages in physical evolution that we recognise.

These early humans started using different kinds of stone for different purposes: basalt handaxes were found with limestone choppers at sites in Israel some 500 thousand years old. At Schöningen in Germany some 400 thousand-years old wooden spear shafts were almost miraculously preserved; they showed signs of having been fitted with stone points, the earliest evidence for hafting so far discovered; some sort of binding material involving knots was probably involved. It is not known when large animals were first hunted, as distinct from scavenged. Stone-bladed spears, accurately aimed, would probably have been needed to penetrate thick hides. Some 100 thousand-years old stone points show traces of resin apparently used for hafting, though some bindings were almost certainly used as well.

A series of post-holes and stones arranged as if for a series of dwellings, with occupational litter and hearths inside, were found at Terra Amata near

Nice, and dated at around 380 thousand years ago. If they did represent dwellings, they may well have required some sort of cordage-like medium and knots to help support the posts and attach the hide or thatch roofing. At Bilzingsleben in Germany there are similar, somewhat younger, sites and also a pointed lance thought to have been bound to a handle. A wolf incisor and a triangular bone fragment from a cave in Austria were perforated as if to make pendants, requiring a suspending knotted cord, some 300 thousand years ago.

People must have been crossing short stretches of water for a very long time, over rivers or lakes or over the sea to nearby islands. While it is possible to swim or cling to floating logs or vegetation for a few kilometres, anything longer would have needed watercraft of some kind. These could have been rafts, coracles, bundles of reeds, inflated skins or canoes. All would have required fastening with cordage and knots except perhaps dugout canoes, but those are unstable in open waters unless fitted with outriggers or twin hulls, which would have needed cordage. Evidence for such crossings is the presence of signs of humans at places unreachable except over water for all relevant periods. The earliest crossings that we know about are to Flores in Indonesia perhaps 700 thousand years ago, and to some Greek islands around 100 thousand years ago. These crossings could have been less than 8–15 km during the periods of low sea-level during the Pleistocene, so we cannot be sure watercraft were involved.

Some parallel cut-marks on some



flat bones more than 100 thousand years old have been interpreted as made while cutting thongs from animal skins.

Some presumed pendants from Neanderthal times (around 100 thousand years ago) have no perforations but grooves presumably for attaching cordage; tight knots would have been required, not just entanglements.

It is uncertain whether all the knots postulated in this section were no more than entangled conglomerates, or whether some real knots would have been tied.

## MODERN HUMANS

Anatomically modern humans, *Homo sapiens sapiens*, appear to have evolved in Africa possibly 150–200 thousand years ago, and then gradually spread all over the world. They are known to have been in Israel before 90 thousand years ago, in Europe before 40 thousand, in the Americas before 20 thousand, and in Australia before 60 thousand years ago. Recent reports of humans in Australia more than 150 thousand years ago need confirmation both of date and of species.

There appears to have been a long gap before there was any obvious change in technology, and then there was an explosion of innovation, most thoroughly studied in Europe. However, some or even all of this apparent explosion may have been due to taphonomic factors, the fact that older specimens are inherently less likely to survive. Many artefacts commonly assumed to have been first made by modern humans can in fact be found much earlier in the archaeological record; they are then rare, but the rarity

may be due simply to the much lower likelihood of survival.

Evidence for modern human anatomy appears a long time before evidence for modern human behaviour. This may have been no more than an example of ordinary biological exaptation, where structures evolve before the functions they later perform; in the evolution of intelligence, a capacity often appears first in a narrow context later becomes extended to others. Or it may have been due to a need for accumulated knowledge, techniques and culture to reach a threshold before any dramatic innovations could take place.

Many believe that the mutations that produced modern humans included changes in the brain circuitry that controls structural language and accurate throwing and hitting. Indeed, there is a hypothesis that there is a common neural circuitry for all of language, throwing, kicking and dancing, planning ahead, insight, musical ability, novel manipulations and tool making and using—and that would include the tying and use of knots.

Language is often held to be a necessary (but maybe not sufficient) prerequisite for rapid radical technological progress. This refers to full language with syntax which orders both words and thoughts, believed by many to have a biological, genetic, basis. An undeveloped language would consist of only a lexicon, a store of words used in a pidgin-like proto-language, and would have a purely cultural basis. If there is a genetic basis for syntax, and the evidence seems good, it must have arisen before humans spread from their point of

origin, since it is found in the languages of all known communities. Syntax is needed to relate things to time and place, and so to complex planning in such things as advanced hunting and gathering strategies involving divisions of labour and communication of knowledge about animal behaviour, ecology, or seasonal fluctuations.

In Europe, the coming of modern humans (Cro-Magnons) around 40 thousand years ago saw accelerating innovation in tools, in techniques (ground and cut as well as flaked stone artefacts), in materials (bone, antler, ivory, wood, hide, horn, clay and ceramics as well as heat-treated stone) and in products (sewing needles, bows and arrows, spear throwers, detachable harpoon heads, fishing tackle, fur and leather garments, nearly all of which involve knotting). And there was the birth of representational art, formal burials with grave goods, the use of tally marks, formal architecture (as in the mammoth-bone huts), and perhaps shamanism. There was substantial cooperative hunting of big game animals. There was also accelerated social change, with large living units, long-distance contacts and regional differences in culture. These things imply strong social cohesion, efficient language use, conceptual thought, advanced planning, and a culture open to change. These properties would also have allowed the development of real cordage and considerable repertoires of advanced knots.

In southeast Asia modern humans occupied the shorelines and developed watercraft of considerable sophistication

able to voyage to Australia and New Guinea for settlement more than 60 thousand years ago. They could not have avoided at least one open-sea crossing approaching 90 km, so they must have had reliable knots! They also moved to New Ireland, and the presence there, some 20 thousand years ago, of many deep-sea fish bones in their middens may be the earliest hint of the use of sails, since prolonged off-shore fishing using only paddled craft seems very laborious, and the effects of wind on watercraft is very obvious.

Elsewhere, knotting activity can be seen in many things. In Israel, there are indications of the frequent use of fish nets some 19 thousand years ago; some fragments of twisted plant material may represent some of the cordage used. Bows required well-made cordage and reliable knots, arrows needed lashed-on heads. Large arrowheads are difficult to distinguish from small spearheads, but almost certain arrowheads are known from at least 30 thousand years ago in Angola, and less certain ones from maybe four times that age.

Stone axe-heads, ground to a predetermined shape obviously intended for lashed-on hafts, are known from New Guinea from 40 thousand years ago, from Australia from 32 thousand and from parts of Europe rather later at around 10 thousand years ago.

There are the remains over much of Europe of many tent-like and more elaborate dwellings, many of them around 10 thousand years old but the earliest were the mammoth-bone structures of 40 thousand years ago. It is

likely that these needed substantial lashing and guying.

Beads as decorations proliferated; one grave in Russia some 25 thousand years old contained more than 13 000 ivory beads and 250 perforated fox teeth, but there are numerous perforated beads and pendants from many places up to 35 thousand years old, as well as smaller numbers much older.; some show microscopic wear marks from the suspending cords.

Limestone, ivory and fired-clay figurines from many places and around 30 thousand years old or younger show apparent belts, girdles, and harness-like straps, some clearly representing two or three-strand twisted straps on, usually, female bodies. There is no clear representation of knots, but there can be little doubt that knotting technology was advanced. Rock art from many places, some of it 20 thousand years old or more, show clothing or decorative or symbolic attire. Headdresses, anklets and armlets are shown, and sometimes what appear to be string bags.

In several of the decorated caves of Magdalenian times (10–20 thousand years old) there are post holes suggesting that ladders or scaffolding could have been used for access to the cave and while painting the art. In Lascaux cave, about 17 thousand years old, there are even some 'fossilised' fragments of two-ply laid rope, some 7 mm in diameter, perhaps from lashings or guys on the scaffolds.

Cordage and knots find much use with domesticated animals. The earliest evidence for the domestication of any

animal is less than 10 thousand years old, but there are some portable engravings of horse heads dating from about 15 thousand years ago and marked as if wearing harness, though that interpretation is not generally accepted.

## CONCLUSIONS

Thus there is good indirect evidence for some knotting activity throughout the hominid line, though certain evidence is lacking before about 400 thousand years ago. Knotting seems to have been a major activity for the last 40 thousand years or so. There is indirect evidence for the early existence of binding knots, lashings, hitches and bends; stopper knots and nooses are also likely, though there is no definite evidence. It is difficult to imagine what the first fixed loops would have been wanted for; certainly, they would have been useful with domesticated animals.

The use of knots for decorative or symbolic purposes may well also be ancient, though there is very little evidence, direct or indirect. Cognitive requirements for such applications are probably different in some respects, but they have been very little studied and such knots will not be discussed in this series of articles.

I thank Robert Bednarik for his comments, calling attention to several very recent items of archaeological information.

## FURTHER READING

The archaeological data are mostly taken from: C. Warner and R.G. Bednarik, 'Pleistocene Knotting' in J.C. Turner and P.v.d. Griend (eds) *History and Science of Knots*, World Scientific, Singapore, 1996, which also gives a full bibliography.

other reading in:

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*Human Evolution*, Cambridge University Press, 1993.

R. Leakey *The Origin of Humankind*, Weidenfeld and Nicolson, London, 1994.

S. Mithen *The Prehistory of the Mind*, Thames and Hudson, London, 1996.

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## FROM OUR POSTBAG

**from** Jesse Coleman, Alabama USA

In **KM 55**, Brian Walsh showed how to tie a delightful 5 lead by 5 bight covering knot. To study it, I tied it in hand, laid it flat and drew it (figure 1). I believe this is not a turks head knot. As illustrated by Ashley and so many others, each cord leaving each bight on one end of a TH goes directly to a bight on the other end of the knot. Walsh's knot doesn't have this characteristic.

It isn't obvious from figure 1, but each end of the knot is the same as the other end.

A drawing of a 5 bight by 5 lead TH knot is shown in figure 2. This knot is quite possible, but requires 5 separate cords to tie.

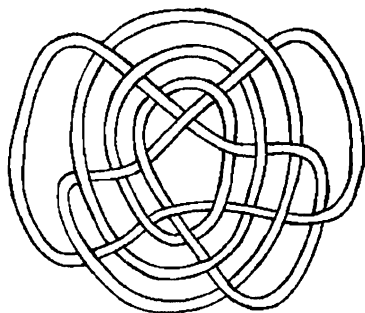


fig 1

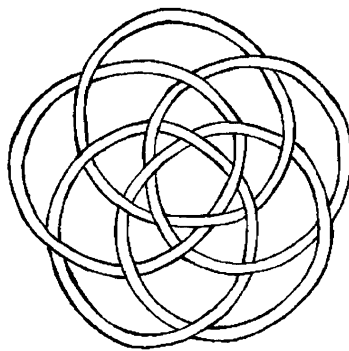


fig 2



**from** R Wiseman, Scotland

I am writing to Knotting Matters to let members know about a video I have been watching for the past week and which has made a tremendous difference to my knot tying. The video is called 'Knots Made Easy' by a fellow Guild member Richard Phelan.

The video is well made, runs for 94 minutes and is well worth the £12.99 + postage and packing. The video is excellently set out and inside the video box cover there is a list of twenty three different kinds of knots showing you how to make boat

fenders, swan necks, mast drop-pers, bell lanyards, key rings and many more.

Over the past twenty-seven years, as a fisherman, I have seen a few sea kit bags with decorative ropework, but the one I made after watching 'Knots Made Easy' has put them all to shame. Not only does Richard show you how to tie the knots, he has also included a list of relevant books, where to purchase ropes and cords (Des & Liz Pawson) and how to prepare and paint some of your rope work. As someone who has been struggling to make a Turkshead of any length, I was amazed to see how easy Richard made it on the video. I feel that this video would be a great assistance to many people, more so to the new members.

I hope Mr Phelan will not be too embarrassed by this letter of praise, but I felt as it has made a tremendous difference to my work, some other members could also benefit from the video and it is great value for money.

Richard's address, 8  
Teesdale Road, Slough, Berks  
SL2 1UD, ☎ 01753 821546

**Ed: We found the video very interesting and easy to follow too, well done Richard, and thank you Robert for your kind comments on KM, and also any others who have commented favourably.**

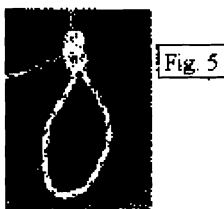
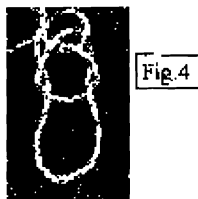
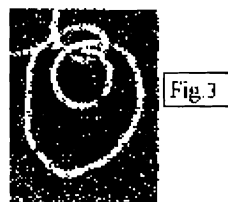


**from Robert M Wolfe, Illinois, USA**

In KM54 a note from Joe Schmidbauer was included which he called Bowline on a Bight. This could also be called 'Perfection Loop on a Bight', since that's what it is.

The way of tying this was demonstrated by Kevin O'Sullivan in a video called 'Teach Yourself Knots and Splices' from Bennett Marine Video<sup>1</sup>. He calls it Burnham's Bowline, and he ties it as follows:

<sup>1</sup> The address of Bennett Marine is 730 Washington St, Marina Del Rey, CA 90292 USA ☎ (310) 821 3329. The video is superb for beginners, but probably too elementary for most IGKT members.



- 1 Start with a small loop in the line as shown in fig 1
- 2 Make a second larger overhand loop overlapping the first loop (fig 2), then lift up the smaller loop and curl the working end under and around the smaller loop (fig 3).
- 3 Now pull the larger loop through the smaller (fig 4), and tighten the knot (fig 5).

'View 2' on p4 KM54 is the same as fig 5 below, just set up differently.



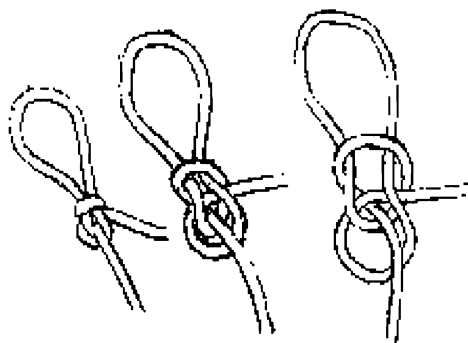
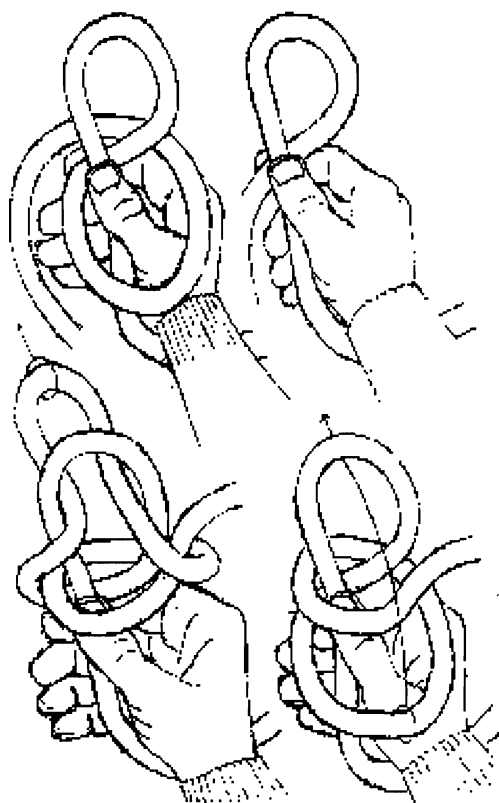
**from** Olof Nyström, Stockholm

The article on a Bowline on a Bight by Joe Schmidbauer in KM54 was very interesting. I happened to know it before as a very practical Bowline, but honestly I had overlooked that it was possible to make it on a Bight.

I had read about it in Captain Sam Svensson's Handbook (Handbook in Sailor's work), Stockholm 1959. Sam Svens-

son considers this knot to belong to the simple, effective bends, which, when they are adequately used, reveal the professional. However, he calls it a Standing Eye and says he has never heard a name for it.

I think Sam Svensson describes an easier and more handy way of making the knot than the Boatswain's Mate, in which Joe Schmidbauer found it. As a matter of fact, it is not



necessary to have a surface as a base for the work. It is easy to make it, holding the rope in one hand and making it with the other hand. I enclose some sketches, showing the procedure.

The Ashley Book of Knots does not seem to include this knot, at least not in my edition from 1960. David Davenport, member of the Swedish Branch of IGKT, has arranged an impressive knot exhibition in the Stockholm Marine Museum, that I visited recently. I think one of the hundreds (thousands?) of knots, displayed by David, is identical with the Bowline on a Bight. He names it Angler's Bend. I tried to call him today to check this but he is abroad for some months.



from Tony Fisher FNZEI, New Zealand

I want to thank the Guild for persevering with me. For the last three years I have been a Union Official and have not participated in Guild matters. You have continued to send me



'Knotting Matters' and friendly reminders.

This period of my life has been traumatic. Our industrial scene here has gone back to the dark ages and for those of us involved with the struggle to help our fellow unionists, the cost has and is continuing to be high. It nearly killed me. The stress was such that my doctor gave me 6 months to live. I left that scene in March last year and the recovery has been slow. I will be forever grateful to the Guild for not giving up on me. It may be worth explaining to the committee this situation that I was in. It is VERY IMPORTANT THAT WE MAINTAIN CONTACT WITH OUR MEMBERS, even if they fail to pay up. I am currently doing odd jobs, relieving work and financially things are difficult. I will pay my back dues as soon as I can afford it willingly and will aim to pay this years subs by the end of March.

My return to active Guild work happened about a month ago, when I was looking at the BT Global Challenge yacht fleet which has been in Wellington for 6 weeks. Lo and behold!

The indefatigable Roger Carter was there with a magnificent IGKT display and a hands on set of knotting boards for all to participate in. It was great to see him again and he invited me to re-join the Guild. I explained my financial situation and he said we can overcome that somehow, but please come back aboard! It's great to be back in with the Guild again.

I have offered to resume as the New Zealand Chapter Secretary and will work with Roger to continue the interests of the Guild in these latitudes. The following matters may be of interest.

**Gilwell Park** I was thrilled to see in KM 53 the report of the AGM being held at Gilwell Park. As a member of the NZ Contingent to JIM which was held at Sutton Coldfield in 1957, we were based at Gilwell, the real heart of Scouting. It was on this trip that I really started my knotting and rigging work. I well remember John Thurman spending time with us, telling us of his interest in pioneering techniques in the use of lashings to build structures. I had already built (and lost) my

first bridge by then and knew what he was talking about. I also remember the beautiful Maori gateway to the campfire site, it established for we Kiwis our right to be there. In this country we call it our Turanga-waewae (our place to stand). It is my hope one day to attend a Guild meeting in England and to revisit Gilwell. To those scouting Guild members; you will be interested to know that the survivors of that trip meet every four or five years and will be having our 40th year reunion at Nelson in May 1997.

**The New Millennium:** mention was also made on page 20 of KM53, about what could the Guild do about the new millennium. Whether or not you settle for an HQ does not concern me here. I would personally hope that any funds the Guild has was spent on communications and supporting publications so that all members can share in the Guilds work. I have a suggestion. The first place in the world to see the sun in the new millennium is on the Chatham Islands. These islands are a remote part of New Zealand, to the east of us. I have an on-

going involvement there, with a scientific expedition (The protection of the *Petrodroma magentate*, the Taiko) and am the rigger in charge of the erection and maintenance of about 7 masts used for telemetry tracking of the birds. I enclose a

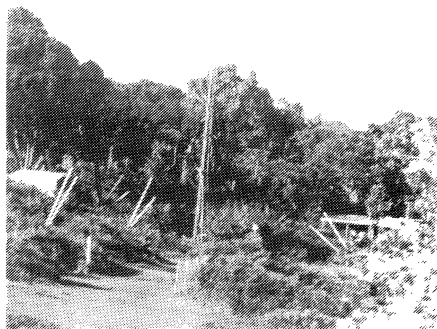
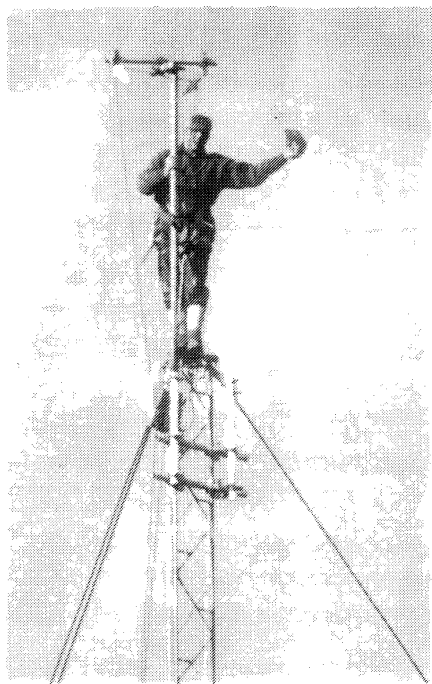


photo of me atop one.

I'm waving my Guild hat, I might add! I'm up there purely because I forgot to put a stopper knot on the running end of a haulage line. With the inevitable consequence! I had to get on top and re-reeve it!

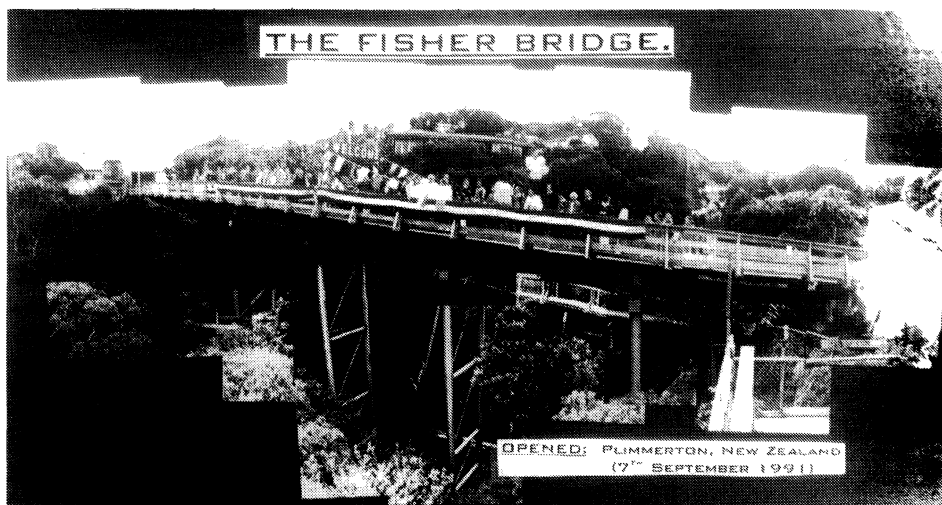


It even happens to old lags like me. My idea is that at the agreed time, that we decide it is day break there, **I tie an agreed knot** (why not our symbol, the 3 lead, 4 bight Turkshead?) **which starts a chain of knot tying around the world as the sun rises at each location? It would mean organising, at set GMT times, members tie the same knot.** I would like to call this idea: **"Knotting-in the New Millennium!"** Others may have a better title. I would be happy to organise it from here.

If there is support, I will get my mathematical astronomer friends at our National Cater Observatory to work out the Longitude times for various members from our list and ask other members who want to participate, to write to me with their locations. If they don't know them, we can work out the GMT times as near as possible. We would, however, need to know if their locations have Daylight Saving in operation then. I envisage a chain of knots being tied over the first 24 hours, linking us in being the first to knot in our own locations. Unfortunately, the very first spot to see the light will be on Pitt island, about 50 miles from our scientific site, so I may not be able to claim being the first person to tie a knot at that time. That site is controlled through a franchise deal with the land owners and the McWhirter people of Guinness Book of record fame. Please give me some reaction and if favourable, I will swing into action at this end. I plan to ask the Guild to issue to all participants a Certificate of Participation after the event.

**The Fisher Bridge:** Please find enclosed a copy of a photo of the bridge I built. I think that it is the biggest bridge to one house in an urban setting in the southern hemisphere and wonder if anyone can dispute this claim? I'm keen to form the Amateur Bridge Builders Association (ABBA) and would

appreciate hearing from guild members. All those enthusiastic riggers and builders of bridges and structures are my targets. The professionals have their own organisations, but we enthusiasts, who often have to employ the professionals in aspects of our work, have nothing.



**Learning Knotting:** This little booklet is the result of 30 years trying to teach people to tie knots. As an educator, I know that until people take ownership of their learning, much of what they take in, remains in their short term memory and never moves onto deep learning mechanisms. In this booklet I have attempted to give learners

a way to teach themselves and from that success to launch into a life time of knot usage and learning! I noted with much interest the debate about various uses of knots and what should and should not be taught. I am a traditionalist. I think that the tried and true should be taught first and any use of specialist knotting with human made fi-

bres should be taught in-situ by specialists. I believe that if armed with a hitch, a bend, a stopper and a non-slip loop, a learner can do most jobs required of a general knot tier. I also believe in the efficiency and beauty of the Carrick-Bend and warning all people about the dangers of the reef-knot. My book covers all of the above.

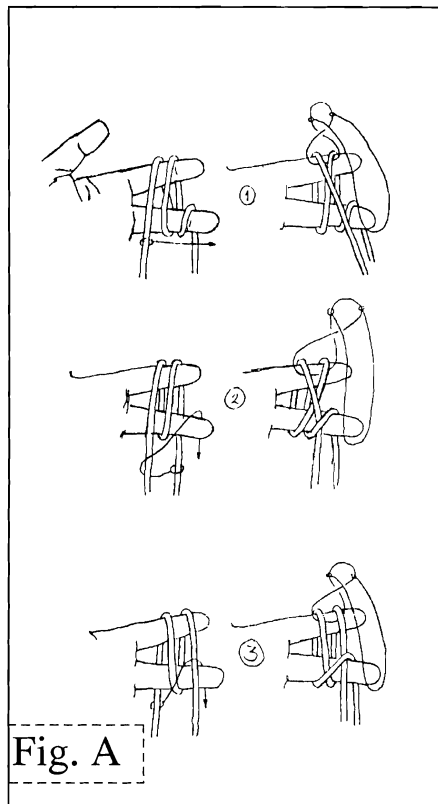
Nigel, Roger and I will be getting together soon to prepare another newsletter from the New Zealand Chapter and we will send it to you as soon as possible. This is purely a personal thank you and to say its great to be back!



**from** Karl Wilhelm Nilsen,  
Risør

Mr. Jens Gunne Johansen of Porsgrunn, Norway introduced me to your guild at the Risør Wooden Boat Festival last year, but due to my sailing periods as a captain of a VLCC, I did not receive the proper material for membership until now. With the material I also received your newsletters of 30/10/96 and 24/1/97. This is very interest-

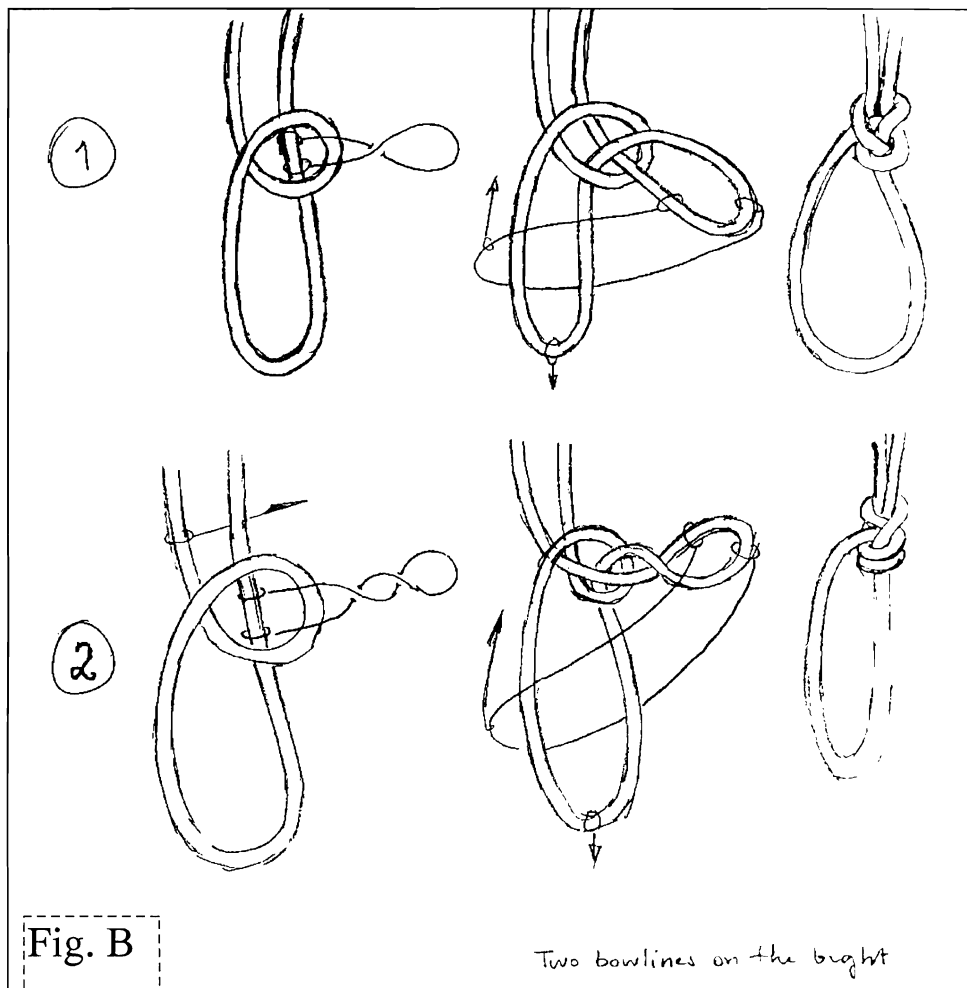
ing, since I have known the two knots for a number of years. I do not claim ownership or anything, I stumbled into them sometime in the seventies while fiddling with a piece of string. The most important fact is that we knot-tiers need a forum for discussion, and until now I did not even suspect that such a forum existed.

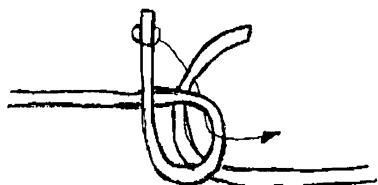


A few words about myself:  
Born in 1942 in Risør, close to  
the sea and with plenty of ships  
and seamen around, with two  
grandfathers having both sailed  
in tall-ships and with plenty of  
time for an inquisitive little boy,  
I could not help developing an  
intense interest in the ropes.

That interest has been with me  
since. I have been collecting,  
experimenting with, teaching  
and learning ropes, seamanship,  
knots, splices, mats, braids etc.  
for most of my life, and intend  
to go on as long as I can.

During the years, I have  
stumbled, as mentioned above.





## "Nilsen bend"

Two interlocked overhands.

One left, one right,

Very secure, very easy to open,  
may be not so strong (break strength)

Will hold in monofil fishline

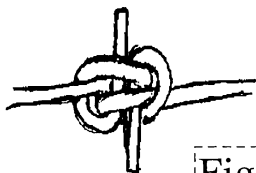
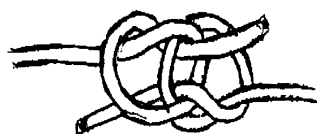
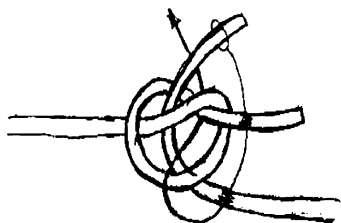


Fig C

into numerous knots that I cannot find in any publications. Enclosed please find drawings of three double constrictor knots tied on the bight (**Fig. A**) (No 3 is the Boa knot. I find No.2 best for the purpose. Mr. Ashley shows it tied in the end) two bowlines tied on the bight (**Fig. B**) (No 2 is the one from Mr. Johansen tied in a different way) and a bend I think is original. (**Fig. C**)

(Ed: This new members address is; **Karl Wilhelm Nilsen, Kastellveien 11, N-4950 Risør.** My apologies for the poor copy

of his originals but he sent Nigel photocopies and Nigel sent them to me. Photocopies do not make the best originals as each generation of copy degrades the quality.)



**from:** Fred Veith, Laingsburg, Michigan USA.

I wasn't going to renew my subscription to KM because I hadn't learned any more stories on how to tie knots. I still haven't learned other stories, beyond the bowline story of the rabbit coming up out of the hole, seeing the dog, running

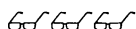
around the tree and back into the hole.

I noticed the KM issue where you published my plea for more stories on how the tie knots, but I received no further information.

I'm renewing for one more year in hopes of still learning more stories and because your KM magazine is hard to ignore. You're all doing a great job for the Guild.



(Ed: I believe that story is for the bowline? The other one I heard was for the Sheet Bend. It goes so; The snake came up from his hole near a tree and had a good look around the tree for any danger, like dogs or cats. Seeing it was safe, he decided to put his head under his belly and rest in the warm sun before coming all the way out. Frightened by a noise he trapped his head trying to pull back into the hole (at this point you pull the standing lead tight) and couldn't get free. We would like to print any stories you can come up with.)



**from:** John Smith. Surrey, England.

Well done on the steady and encouraging improvements in Knotting Matters. I confess to a (small) yawn when opening issues over the previous couple of years, compared to a frenzied ripping open of the envelope to get at earlier issues. Now, for the first time in quite a while I am actually stimulated enough to send something to the editor again. Thanks.

The correspondence initiated by Joe Schmidbouer on the Single Bowline on the Bight is just the sort of thing that Knotting Matters handles so well.

It is my belief that Ashley's #1017 called Anglers Loop, is one of several knots linked by name to the Bowline. I mean the Bowline described by Ashley as #1010. Perhaps this has come about because of the fame of the Bowline and people using the name to indicate that another knot is of the same type, i.e. a good loop, usually in the end of the line.

When demonstrating the Angler's Loop, I often hear someone say "Ah yes, that's a Bowline". In some cases it is mis-



taken identity (understandable) and in some cases I found they actually mean that they see it as a Bowline type knot or a substitute for the Bowline.

For those who have followed this correspondence, I strongly suggest a read of Ashley numbers 1057 and 1058 which are knots that might be called The single Bowline on the Bight. Then look at the article in Knotting Matters 19 page 2, "Variant Bowlines", followed by the completion of the thought in Knotting Matters 20 page 7, "THE Single Bowline on the Bight".

I know that Owen K Nuttall has some alternative thoughts on this, which he and I discussed at some distant AGM, but I cannot find any published material.

Mention of Brion Toss's excellent book brings happy memories of the Knotting Extravaganza in Greenwich in 1986, when many Guild members were introduced to the FLYING Angler's Loop. What really happened was this:

I was mightily impressed with Brion's book *the Complete Rigger Wire and Rope*, published

(1985) *Stamford Maritime Ltd* (originally published as *The Rigger's Apprentice*). Impressed enough to actually buy it and for me that means really impressed. I struggled to make his Tugboat (or Flying) Bowline. **It is important to realise that this is NOT the same as the Angler's Loop.** Brion is precise and accurate in his description, saying that "this Bowline is really a form of the Angler's Loop."

During one of many practice sessions, I noticed that I had, accidentally, tied a true Flying Angler's Loop. Even more attempts were made to find out what mistake I had made that produced this different knot. The answer was in what you do with your left hand. Turn the wrist out before you pull the loop through and you get Brion's knot as illustrated in his book. Keep the wrist turned to the right and you are putting in an extra twist, this makes a true Angler's Loop.

Of course, it happens over and over that we stumble on something we think is new when somebody else has done the same thing in another place at

another time. That didn't stop enthusiastic flying displays anywhere, anytime to anybody who was interested (and a great many who were not), involving much knocking over of glasses, furniture and risk to eyesight. Since then, memories have emerged of such knots and techniques from way back. Great, that's what the Guild does so well.

See what you've done, got me stimulated. Here's a story of how knotting can turn up in the most unexpected places.

I have been running a series of training courses and presentations on Total Quality - Continuous Improvement. The grossly simplified message is always look to improve a process, involve the people who actually do the work because they know a lot you don't, use analytical methods to really see what is happening, look for new methods and the giant leap of imagination, never think that you have the best method, always believe that an improvement is possible.

To illustrate the point and get some light relief, I demonstrate

various ways to tie the Angler's Loop.

First, the TRADITIONAL way. Follow a laid out diagram step by step. Make an overhand knot, put the end through, then tuck the end back and so on. Time taken: 14 seconds.

Second, INVOLVE THE WORKERS, ask the people who actually use knots. They would never put an end through and then tuck it back. They would pass a bight through. They would turn the knot as it forms to save time. Time taken: 10 seconds.

Third, use ANALYTICAL methods. Get the IGKT to discuss, analyse and realise that this knot is made of a series of turns all going the same way. Tie it like Ashley does in #1017. Time taken: 4 seconds.

Wow, what a saving. Surely that beats all! A reduction in process of time from 14 to 4 seconds.

Last, the IMAGINATIVE was, a Flying Angler's Loop. Time taken: 2 seconds, sit down to loud applause.

There is a drawback. I have found over some 20 courses that the delegates don't remember

much of the content, but they do remember “the Rope Trick”.

I seem to have about four or five “Flying” Knots now. With a few more I might form a

breakaway section of the IGKT, The Aeronautical Wing or Flying Corps.



## NEW KNOTS ?

New Knot discoveries, invention, innovation and design is a subject touched on several times in the last few issues of KM. Remember it was the exciting “invention” of the Hunters Bend that was the catalyst which brought together the founders of the Guild. If we do wish to be as we say, the world authority on knots and knotting matters, then we need to agree an accepted path for declaring a “New Knot” or method of tying, crediting the author and registering the event.

As I see it, a proposed new knot or method is published in KM as ‘New’ by the author, words of contradiction come forth from the membership and it turns out that either it is known by many but has never been published before, to our knowledge, or it has been published before, somewhere. There are many cases where a knot or method of tying is kept as a virtual secret, handed down from father to son or master to apprentice. To be published would change the nature and importance of the job or craft. In such cases can publication be the only deciding factor?

Is the first to publish a book on Fender Making, Half Hitching, Knotted Letters, Jewellery or Animals the inventor or discoverer or just the authors of good, descriptive ways of doing this task? Perhaps there is nothing new under the sun, only waiting to be rediscovered for a new age. The next three letters discuss this subject in detail and with some passion.

Please refer back to previous KM’s for more back ground and then send in your opinions. Each members opinion. no matter how skilled at knots or rope work, is valued on such a broad point.

**from:** Owen K Nuttall, Huddersfield, England.

In his letter, Roger Miles (KM 55) states that my **Folded Arms** (KM 54) is Harry Asher's knot **Sleeping Beauty** which is on the cover of his *Alternative Knot Book* published 1989 and the same knot is in his own book *Knots and Everything* (A15) published 1995.

There seems to be some confusion about this knot with two names. I first tied this knot ten to twelve months before joining the Guild after reading Geoffrey Budworth's *Book of Knots*, October 1984. Unfortunately I cannot substantiate this claim as all knots were from memory until I joined the Guild. This knot has been researched fairly methodically to see if it was a new knot. I have looked through numerous books and back issues of KM (I have all but the first four). Unfortunately I have not seen Harry's first book of knots for the Guild entitled 'A New System of Knotting' 1986 and his later 'Alternative Knot Book' published 1989, so in good faith for the second time I send this knot **Folded Arms**. The first time I sent this knot

was 16 October 1985 along with 23 other knots which I thought were new to the Guild. Some of these knots have appeared in past issues of KM. This was one year prior to Harry's first book and four years before his second book and ten years before Roger Miles' book. Confusing ain't it.



**from:** John Halifax, Suffolk, England.

In consequence of Stuart Grainger and Geoffrey Budworth's articles "A Hens Tooth" and "The Boa Knot" in KM's No.55 (pages 19 and 52) concerning the method of 'Doubling a Constrictor Knot' by Peter Collingwood.

I became extremely annoyed with the situation of claims being made about so called 'New Knots' being 'Invented', 'Discovered' or whatever. 'Devised' is another expression. Published they have got to be; then the whole membership of the 'Guild' has an opportunity to make written 'Reply/Comment' or 'Critique' or otherwise 'Extolling it's vir-

tues' or by a 'Non Response' all of these processes would then tend to 'Ratify an accepted Agreement' of the new 'Knot Discovery'.

Not forgetting of course that someone else might like to lay claim to having 'Discovered' this 'Contrivance' before, or the 'Method' of tying/make-up etc'.

This, of course, being the reason for this missive and copies of my new ideas and thoughts which I have sent to the 'Editor' for publication.

Regarding my suggestion that a 'Sub Committee Quorum' should be set up to 'Ratify' contentious issues. On reflection, because our Guild is run on a voluntary basis; this idea would impose even more work on the ever pressed small body of willing volunteers who keep the 'ship' running. So in conclusion it has got to be down to the simple process of 'Publication' without extravagant claims as to absolute 'Discovery/Devised' etc. (Perhaps the Editor could, in his 'Editors Bytes and Pieces' include a Standard 'Cautionary Notice' in every issue of KM that all assertions or claims of

New Discoveries are subject to 'Ratification' or 'Otherwise' by 'Members Subsequent Comment or Otherwise')

The fact that the 'Hunters Bend' in 1977 transpired to have been discovered some time earlier by an American and named 'A Riggers Bend' and now I am laying claim to having discovered the 'Boa Knot' in 1989 tends to prove a point that they are all there somewhere between the two ends and that nothing is new under the sun. It is a delicate political issue which must be addressed if history is to be served correctly!

Enclosed are what I believe to be new ideas of variations on old themes, Progressive Constrictors, New Sheepshank and Button Knot with hints and tips.



**from:** Stuart Grainger, Oxon. England.

(In answer to John Halifax's above letter.)

If you read carefully and dispassionately what I did say in "Knotting Matters" No.55, page 20, you will note that the title itself, A Hen's Tooth?, contains

a significant question mark, which indicates doubt about the knot's rarity. The second line mentions that Peter Collingwood's letter used inverted commas to surround his use of the word "invented", which clearly indicated to me that he doubted the accuracy of this. He is a man of very high principle, whose honesty and integrity are beyond any doubt; he does not seek or need fame, having already achieved more of that than he wants, even assuming that an appearance in "Knotting Matters" can provide that doubtful benefit. He writes to me occasionally with snippets of information that he knows will interest me and this was just one such snippet.

As my little article explains, I had not seen this knot before, although both the Constrictor and Strangle Knots are well known, of course, so I consulted Geoffrey Budworth, who, of all the experts I have met, has the most encyclopaedic knowledge of knots, and he did not know this one either. His comments are quoted in my article. None of the published works of reference in our combined libraries

shed any further light on this particular knot, so I felt justified in saying that "as far as we know, it is new". No other claims were made and the article was sent with my drawings to the Editor, who made the decision to publish it.

It has been my experience over many years of writing on craft subjects that, as soon as someone describes an innovation in print, someone else will claim that they have followed the same procedure for years and did not feel it worth publishing. It is a fact of life that publication of an innovation can not be made retrospective. If it can be shown to have been published earlier elsewhere, as sometimes happens, due to geographical or political factors or simply a long lapse of time during which the earlier publication has been forgotten, there is good reason for printing an explanation of the facts. In a case where there is a claim of prior innovation without publication having followed, the claimant has only himself to blame and must suffer his understandable chagrin as best he may.

“Knotting Matters” exists, at least in part, to provide a vehicle for disclosing and disseminating information about such innovations in the craft of knotting. It is open for use by all members of the Guild, subject only to the Editor’s scrutiny and approval. If a member declines to make use of this opportunity, it is surely unreasonable to blame another for doing so, and still worse to attempt to sully another’s reputation by way of justification.

To suggest, that the entire membership should have sight of any claim of innovation before it appears in “Knotting Matters”, in order that its novelty may be a matter of consensus, is ludicrous. It negates much of the purpose of “Knotting Matters”, which under such a system would have to be circulated virtually in draft form before it could be printed, even assuming that such a consensus could be achieved. Months would be wasted on circulating argument and counter-argument, without achieving anything, just so that those suffering from inertia can have an opportunity of claiming

prior knowledge, which opportunity they already have but neglect to use. The difference between the ‘Hunter’s Bend’ incident and this one is that the original discoverer of the ‘Rigger’s Bend’ actually did publish it some time before and a long way away, before “Knotting Matters” came into being, so it was not surprisingly overlooked. Despite the best endeavours of Geoffrey Budworth and myself, no trace has been found of ‘The Boa Knot’ in any publication available to us, least of all in “Knotting Matters”, which is where we would have expected a Guild member to publish such an innovation. We therefore felt at liberty to make the very limited claims published in my article. If you can show any evidence of prior publication I shall be happy to acknowledge it.



## Basic Knots

**from:** Colin Grundy, Coventry, England.

Peter Goldstone’s controversial talk on the six Tenderfoot knots certainly seems to have provoked a reaction from mem-

bers, especially Mike Lucas (KM 55 pg 7). No doubt this was the intention, and also to get members to think about what knots we are teaching and why. I cannot entirely agree with Peter's comments though.

It is now some thirty years since the Tenderfoot badge passed into history. Scouting has moved on since then and the award scheme no longer stipulates the knots that a Scout should know. In the Pathfinder Award, a Scout now has to 'carry out an activity using a knot, a bend, a hitch and a lashing'. Surely it is up to the leader to teach an appropriate knot for the particular job in hand. I have always been taught the requirements of a good knot is one that is easy to tie, easy to untie and be suitable for the task.

Some of Peter's comments also make assumptions that the Scouts being taught will be land based, rock climbing enthusiasts and carry out their pioneering with shiny polypropylene rope. What about the Sea Scouts, those Troops who do not have leaders with the appropriate mountaineering qualifications,

or have always used natural fibre ropes for their pioneering? Surely they should not have to change their knot tying habits.

The six knots still have their uses, and leaders will always have their preference. The Tenderfoot knot test has gone, except as an amusing side show to challenge the world record. Instead, let us make sure that the correct knot is used for the task, and better still teach it in its practical application!



*From Tony Doran, Surrey UK*

The recent correspondence on basic knots, i.e., the minimum set of knots a beginner should be introduced to, has not made it very clear that the merits of a knot can only be judged in the context of a particular application. The fact that a Reef Knot can be capsized makes it a good knot for reefing/unreefing sails, but a bad knot to use to bend ropes together. A Sheepshank is a knot of minor importance because it has little practical application.

It would be a sad day if the IGMT could not produce an up-



dated list of basic knots that takes into account changes in the material properties and construction of modern ropes. The first step in identifying a list of basic knots should surely be to define a set of general applications, then to identify the knot most suitable as a basic knot for each application. I offer the following list to generate discussion:

### **General Knot Applications**

Tying a rope/line:

- to itself to make a stopper
- to itself to make a fixed loop
- to itself to make an adjustable loop
- to itself to make a fastening
- to another line of the same size
- to another line of a different size
- to an object to exert a pull on it
- round an object or objects as a binding
- round an object as a lashing.

I would like to invite IGKT members to comment on the list with suggestions for additions / amendments. If a consensus of general applications can be established, Guild members can

be invited (via KM) to identify a basic knot for each application **using modern rope**. Where there is no clear majority in favour of a particular knot an open discussion on the merits of the main contenders can be held to establish the 'Guild recommended' choice.

My own feeling is that the exercise will produce a list of eight to ten basic 'general purpose' knots that could be the IGKT equivalent to the Scouts' Tenderfoot knots, and could possibly replace them.

I am willing to handle the correspondence and produce the analysis of returns.



**from:** Anne Dyer, Westhope College, Craven Arms, Shropshire, SY7 9JN.

Tell: 01584 861 293

Dear Knot Tyers, I have been asked to let you know about

**THE BRAID SOCIETY  
EXHIBITION  
at the  
ARMLEY MILLS, LEEDS.**

The work of all our members, beginners, teachers, experts, the full range of the subject from useful to elegant to crazy, fine and bold, traditional and modern; come and see it all :

**Tuesday 30 September**

**to**

**Sunday 16 November**

**10 am to 5 pm**

**Sunday 1 to 5 pm**

**Closed Mondays**

£2 entry to the Mills, nothing extra to see the exhibition. Also,

**THE BRAID SOCIETY**

**AGM**

**November 1st 1997**

**also at the**

**ARMLEY MILLS, LEEDS**

**from 12 to 1 pm**

1 to 2 lunch, bring-your-own.

2 to 3:30 the lecture by Peter Collingwood on the split-ply camel girths in his collection, £2 non-members, plus £1 museum entrance. Tickets from Chrissy Bristow, 1 Highbury Villas, Ash Green Road, Ash-green, Aldershot, Hants, GU12 6JF. Please send a stamped, self addressed envelope.

Split ply is an ancient craft, where tightly twisted cords are threaded through each other to make a textile like a double layer of oblique fell plaiting that has been bonded together. Elaborate patterns can be made, when 2 different coloured cords appear and disappear on the surface, which leads, nowadays, to jewellery.



**from:** Brian Glennon, Massachusetts, USA.

Here is a diagram I received from **Izorline International, Inc.**, a fishing line company, which illustrates how to tie the Albright Special Knot, a knot devised by commercial deep sea fishermen to solve the problem of how to bend two inherently slick (and very slippery) fishing lines together. Spectra and monofilament. The Albright Special knot is a bend which the **Izorline International** company endorses rather than the use of glue, stitching, or mechanical clamps to secure these two very different fishing lines.

I just happened to be reading a fisherman's news group on

the Internet when I glanced the word 'KNOT' in the subject area (see REC. OUTDOORS. FISHING) of a newsletter. There was an ongoing dialogue regarding knots and which ones were the best to use to secure leaders, lures, hooks, or flies to fishing line.

Naturally I followed these discussions with both great interest and admiration, for fisherman, in my opinion, are the great innovators in knotting; they have to be, their livelihoods depend on it.

One topic was how to secure a spectral braided line leader to monofilament fishing line. If you're familiar with these materials they are as slick as Cod Liver Oil and notorious for not holding a knot very well.

The discussions ran the gamut from stitching, gluing, or clamping the two ends together. Someone who identified himself as 'Tuna King' casually mentioned the Albright Special Knot used by the off-shore fellows and to contact a Mr. Pete Haynes of **Izorline** for tying instructions. Well, I spent two

days tracking down **Izorline** and was rewarded by being faxed with this diagram, courtesy the **Izorline** company!

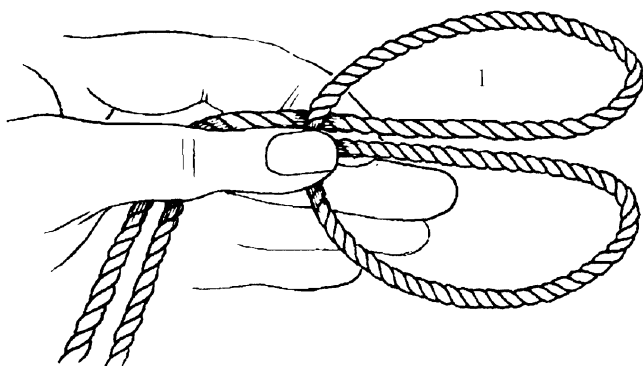
Now, in my first analysis, this bend resembles a variation of a common whipping, or snell. (I used to snell fishing hooks for my father in 1965 when he long-lined for a living.) So if anyone can positively identify this bend, please respond in Knotting Matters.

Also a question has arisen in my mind. Since the material Specra wasn't marketed until 1985, and more high technology textiles later on, does tying a knot in these exotic materials, for a different purpose than the knot was intended originally, make it a new knot? Probably not, but it is an intriguing thought.

My sceptical opinion on the value of the Internet has been challenged by my lucky discovery of this Albright Special Knot. For some lively discussions on knots, please visit the NEWSGROUP:

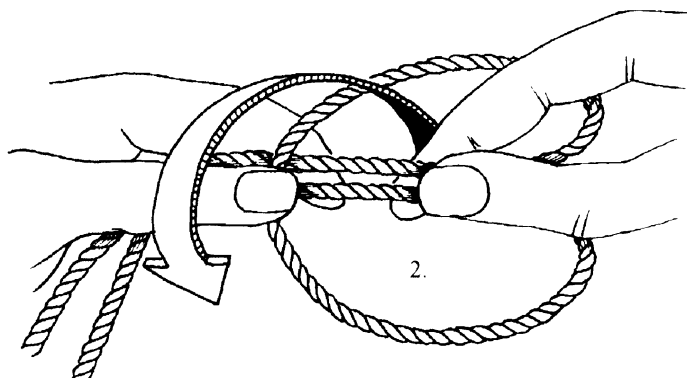
REC.OUTDOORS. FISHING

## A SINGLE BOWLINE ON A BIGHT - forming a single loop in a bight with no ends

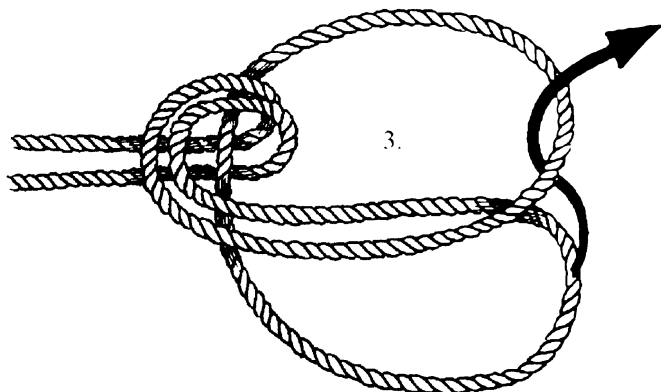


Fold the centre of the bight back on itself to form a crossing and hold it with the left finger and thumb

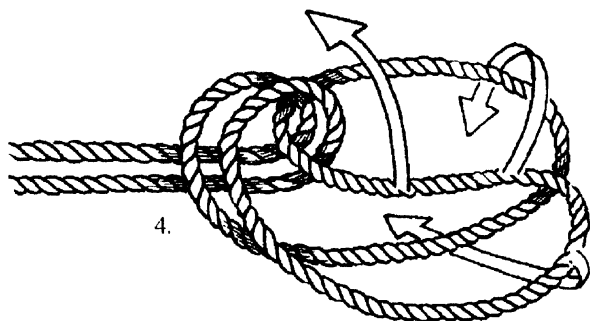
Grip the two central parts below the crossing, as shown in 2. and twist anti-clockwise to



form a double half-hitch lying over the crossing, as shown in 3. below and hold it with the left finger and thumb as before.

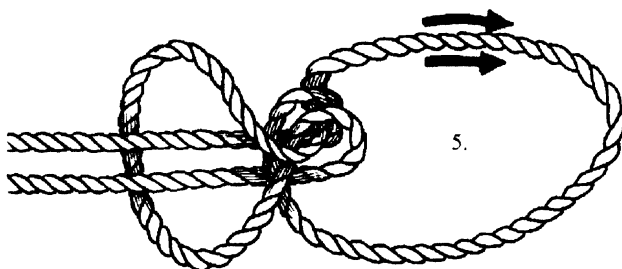


Pull the lower loop through the upper one, as indicated by the arrow in 3.

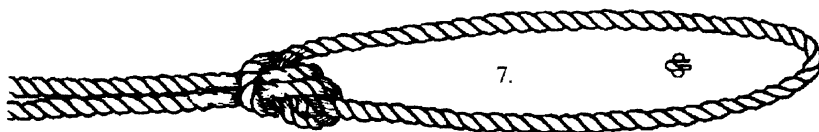
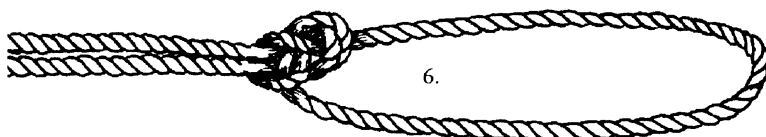


Open out the loop that is now on top, pass it around the other loop and back around the entire knot.

Pull on the upper part of the remaining loop to take up all the slack.



6.shows the front of the completed knot and 7.shows the reverse side.



### A Single Bowline on a Bight.

Information supplied by Jens Johansen of Porsgrunn, Norway, who says that he learnt this knot from an old sailor years ago, but has never seen it published.

*Drawings by Stuart Grainger 24/1/97.*

# **KNOTS & THE** **IGKT on the INTER-** **NET**

by  
**gordon@g-  
cisc.demon.co.uk**

Thanks to IGKT member David Bowie and "Webshirt" at Billerica, Mass. USA the Guild now has a significant presence on the World Wide Web (WWW) of information. Just ask a Web Browser to find you 'knot' and it will lead to a surprising number of pages of information on knotting, from the Tenderfoot knots to ...you guessed it - mathematics. There are too many web sites to mention every one, and in any case one generally leads to another, so to mention but a few - that will lead you into the myriad

The IGKT home page - <http://www.webshirt.com/IGKT.html> a brief introduction to the guild and links to at least 8 other sites and an e-mail link to the guild (via myself).

The Scout Association of Australia [http://www.fcollins.com.au/Scouts/knots\\_ad.html](http://www.fcollins.com.au/Scouts/knots_ad.html) lots of drawings and explana-

tion of knots, ties and splices used in the Scouting world. Run by Alistair Honeybun.

A good link page for knots on the web is run by Peter Suber of Richmond Indiana - <http://www.earlham.edu/suber/knotlink.htm> . Dig even deeper from here to look at The World Wide Web's Knotting Index, The Knotting Dictionary of Kannot, The Knots Home Page and many others.

The KnotPlot Site - run by Robert Scharien from the University of BC Canada, containing some interesting computer knot drawings is at <http://www.cs.ubc.ca/nest/imager/contribution/scharein/KnotPlot.html>

I hope I have given you a taste of what is out there on the INTERNET without taking up too much valuable knotting space in KM! But perhaps the most important thing about these pages is that they all lead to the IGKT via one link or another, generating about 30 or so enquiries a month on knots or IGKT membership, from all over the world.

Finally, if you have an e-mail address of access to the INTERNET please let me know as I am putting together a list of members on the net - tell me if you do not want yours published please - then eventually we can incorporate it in the Membership Lists for the future. Who knows, one day this medium might save the Guild a lot of postage and KM could arrive all over the world on the same day! One day, hay?



**from:** Penny Bodger,  
Leicestershire, England.

**A visit to the Sunset Line &  
Twine Co, Petaluma,  
California**

My brother, a Petaluma local, had long been intrigued by the creeper covered facade of the old building housing the Sunset Line & Twine company and the busy clack of machinery emanating from its interior whenever he passed. So he seized upon my recent stay with him as an excuse to talk his way in to a conducted tour of the works. We duly turned up on the appointed day clutching our credentials - an IGKT leaflet - to be greeted by John Agnew's

father who has worked for the company for some 60 years. John himself soon took over and we embarked on a tour of the building from bottom to top. John was a mine of fascinating information.

The impressive historic building dates from 1892 and is unique in Northern California being built in the style of a New England textile mill. It functioned originally as a silk mill, receiving and processing silk from the Orient until WW II curtailed this import and Sunset relocated there in 1940. The company had been founded a few years earlier in San Francisco as a manufacturer of fishing lines and soon expanded and diversified.

Our tour took us through the main body of the mill on two levels both housing banks of incredibly noisy braiding machines, twistors and the various winders and spoolers necessary to prepare material and deal with it during all stages of the processing. The basic design and construction of the braiders has remained relatively unchanged over the years and many of the machines refuse to

wear out and have been there since the early days. We saw 8, 16 and 32 strand round braiders in action as well as some machines producing flat braids. I tried to visualise the miles of cord produced over the years as I watched the twirling bobbins shuttling through their intricate maypole dances and the steady streams of completed braids inching their way onto the take-up spools - in their heyday Sunset ran some 2,000 braiders alone.

In one corner John carefully removed the cover off a long contraption revealing a series of rollers and 10 troughs of different coloured paint/dye - an ingenious chain-driven home-made device to colour code trolling line with 30 foot colour bands to allow easy gauging of depth. The floor in that area showed an interesting range of patterns and colours and we joked that the sale of modern art could become a lucrative sideline!

We visited some of the adjoining rooms, welcome oases after the noise and hubbub elsewhere - the steam room, where the steam engine which

powered the silk mill used to be housed; the oil room so named when natural fibres necessitated specialist treatment: the dyeing room where the raw material is dyed in large vats under carefully controlled conditions. We heard stories of early "spoon" dyers whose recipes were carefully guarded secrets and who carried a miscellany of assorted nuts and bolts to act as weights when they were measuring out proportions of dyes. Their rule of thumb expertise has now largely been replaced by standardisation enabling reliable replication of colours by dyeing out till all the colour has been taken up.

A small business like Sunset, John told us, could be extremely flexible in its production, could turn orders around in a hurry, do short runs to order, and hold its own among the larger companies in the modern world. They currently employ about 35 workers in two shifts.

So what **do** they produce? The answer is an impressive array of cord with a wide variety of uses as one can see from reading their catalogues -



everything from Duck Decoy Cord, through Seine Line and Mason Line, to braided lacing tapes conforming to various military specifications. The early production of linen and silk twines and braids has largely given way to synthetics though they still produce a few linen cords for lacing and serving, and a braided cotton lacing cord primarily used for lacing and tying in aircraft fuselages! Other lacing tapes and cords, some with fungistatic wax coatings, have applications in the electronic and aerospace industries, specialised braids and threads are made for industrial users such as the building trade and for recreational uses, and a variety of more general cords are sold through hardware and marine outlets, not to mention the mill ends which are popular with macramé workers.

Fishing lines are still an important part of Sunset's market and comprise products such as soft braided nylon casting line, braided polyester fly line backing and big game line, and of course the coloured depth gauging trolling line some

of it with an alloy lead core for reaching deep water fish. These are mainly for sport fishing but they also produce a special hard wearing braided nylon leader line for the commercial fishing industry where it performs very well with modern automatic baiting machines used for long lining. They have an important export outlet for fishing lines in the UK and for years have supplied a special monofilament line to the Hawaiian Islands where the heavy wear fishing conditions take their toll of less durable lines. Finally one of the best sellers back home is a monofilament which they process to make it "memory free" and market under the name of "Amnesia"! This is one of those extraordinary accidental success stories as it was originally being sold as a binding twine for general use on things like golf clubs. A fishing friend had the idea of trying it and announced that it was the best he had come across. Another friend came up with the name and the rest as they say is history!

Last but not least they used to supply the parachute cords for

the Apollo and Gemini space missions, only to be put out of production of that particular line by the advent of the Space Shuttle. John said he's always considered it rather ironic that in a multi-million dollar enterprise the all important return to earth should be entrusted to \$500 worth of string!

What an interesting morning. Armed with catalogues and samples we left the cool airy rooms of the old mill and walked back out into the warm Californian sunshine wondering how many inhabitants of Petaluma know anything about the remarkable industry in their midst.



**from:** ex-president Percy Blandford, Warwickshire, England.

I was interested to read the lengthy letter about cowboy knots from Michael Storch (KM 56), particularly his comments on the use of rawhide. My own brief contact with modern cowboys was in South Dakota. Their interest in knotting was almost nil and the equipment

they used was made by someone else.

Michael says there is no book on the cowboy knots, but I wonder if he knows about the **Encyclopedia of Rawhide and Leather Braiding** by Bruce Grant, (pub: Cornell Maritime Press, Centreville, Maryland, USA). A well-illustrated book of 528 pages that started life in 1893 and contains a terrific amount of information on the use of rawhide. My reprint is dated 1972 and cost \$20. In England Des Pawson should be able to supply it.

Cornell also publish **How to make Cowbot Horse Gear and How to make a Western Saddle** by Bruce Grant and Lee M. Rice. I have not seen it, but it ought to interest Michael

I wonder if Michael has been in touch with David Barrow. When we visited him about 10 years ago, he gave Ivy a walking stick (American 'cane') covered with a multiplicity of rawhide braided patterns. In his truck the gear lever, fascia and door panels, and just about everything else in sight, was covered with rawhide braiding.

# Guild Supplies

## Price List 1997

Item	Price
<b>Geoffrey Budworth</b>	
Knotlore <i>a miscellany of quotes from fact and fiction</i>	£2.50
Much Ado About Knotting <i>history of the 1st 10 years of the Guild</i>	£2.50*
The Knot Book	£2.50
<b>Brian Field</b>	
Breastplate Designs	£2.50
Concerning Crosses	£1.50
<b>Eric Franklin</b>	
Turksheads the Traditional Way	£1.50*
Nylon Novelties	£2.00*
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Turks Head Alternatives	£2.20*
Creative Ropecraft Hardback	£9.95
Knotted Fabrics Hardback <i>price includes UK postage</i>	£9.00
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<b>Colin Jones</b>	
The DIY Book of Fenders	£9.95
<b>Harold Scott</b>	
On Various Cruxiform Turks Heads	£2.50
<b>IGKT</b>	
Knotting Matters copies of passed editions ( <i>some photocopies</i> )	£2.50

\* bulk purchases of these items available at a discount - phone for details

Cheques payable to IGKT or simply send your credit card details  
**PS** Don't forget to allow for Postage

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**Supplies Secretary: - Sylvia Harding**  
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