

ISSUE 54 DECEMBER 1996

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# Knotting Matters

Newsletter of the



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# KNOTTING MATTERS

THE QUARTERLY NEWSLETTER OF  
THE INTERNATIONAL GUILD OF KNOT TYERS  
ISSUE NO 54 - DECEMBER 1996

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## EDITORS BYTES AND PIECES

Merry Christmas and Happy New Year. May God bless you and all your family at this holiday season, from Margaret and myself. This will be a short EBP, as we were unable to attend the AGM at Rotterdam and have had no report from anyone who did attend. I'm sure that it was interesting and friendly as our meetings always are, even the ones with heated debate during the business meeting.

There have been many helpful suggestions given to us about how we can improve the look and content of **KM**, all are considered, thank you. We hope that you find much to enjoy and interest you in this issue of your magazine.

\*\*\*

### **A request from Richard Thomas - Hertfordshire, England**

Whilst spending some time on the Thames Tug General VIII, I have seen frequent use of a modified form of the Bargee's Eye Splice (p29 Shell

Combined Book of Knots and Ropework).

In the version used, the tail is brought down after the tuck and threaded through the initial overhand knot as additional security.

Richard Hopkins and I have searched through Ashley and other books in his extensive library but cannot find this particular variation.

Does anyone know if there is an 'official name'? Has anyone any comments?

## BOWLINE ON A BIGHT

from Joe Schmidbauer  
California USA

I learned this knot while in the service some years ago. It is such a handy knot to know; I thought to pass it along to the other members of the Guild. This is the only time I have seen a Bowline on a Bight tied in this manner. I have searched the knotting literature and have not found mention of it anywhere else. Does anyone else have previous knowledge of this knot?

The following illustration and description are from 'Boatswain's Mate 3&2'

NAVPERS 10121-D. Third edition 1964; US Navy Training Publications Centre, Washington DC.

This is a knot that comes in handy whenever you need an eye in the centre of a line. It can be tied quickly, doesn't jam tight, and you don't need an end of the line in order to tie it. To get your securing lines taut, a single Bowline on a Bight is a good knot to use for securing equipment or cargo. Tie the knot well up on the standing part, run the bitter end around a stanchion or through a padeye and back through the eye of the knot. Heave back on the bitter end in a line between the knot and stanchion or padeye. This gives the same effect as having a block on the line at the knot and, discounting friction, doubles your pull. Heave it taut and go ahead and secure the end.

To tie this knot, form bights A and B as in view 1. Next, lay part C, between bights A and B as in the second view. Then reach through bight A, over part C, and pull bight B back through A. Tighten by pulling on part D and bight B.

Completed knot is shown in view 3.

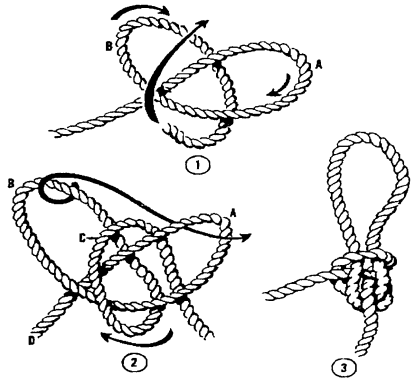


Figure 3-14. —Single bowline on a bight. . 80.27

*Ed: So come on members have you seen this method illustrated before, and if so where?*

An interesting snippet from Brian Glennon - Massachusetts. Brian is a rigger, and tends to move around quite a lot. He has now just been hired as a rigger on the HMS Bounty, the ship used for the 1962 film *Mutiny on the Bounty* which starred Marlon Brando. Is this real hands on knot tying of old Brian? By the way lucky chap gets to spend winter in Florida.

## A MEMBERS PROFILE

### YNGOE EDELL

presented by Ken Yalden at  
Rotterdam 1996

**How I became interested in knot tying:** *A woman in Sweden who was embellishing bottles very beautifully by macramé techniques, and she also made handsome Starknots.*

**How I found out about the Guild:** *At first I came across it in a book. It was Des Pawson who finally made me a member when I was working as a guest performer at the National Maritime Museum in Greenwich last June.*

**What aspect of knotting is MY main interest:** *Hitching bottles, jars, jugs, needle cases, knives etc.*

**What interests other than knot tying do I have:** *I like target shooting by pistol, I am a fairly good horseman, and have shod my own horses for a period of 10 years. I am also interested in cutting and tailoring, partly educated by the Tailor and Cutter Academy in London.*

*Ed: Thank you Yngoe, and also Ken, these little member profiles are very interesting,*

*especially in an organisation where it is very difficult to meet many members. If any other members feel so moved, please feel free to complete a similar profile. Also if anyone has any ideas of profiles they would like to see done, please let us know and we can persuade the person to submit some information.*

## WOODEN BOAT SHOW - CONNECTICUT - USA

### From Brian Glennon

Brian thought members would like to know that the IGKT was well represented at the above show in June. The Guild had a table, always busy with interested onlookers.

Mr Albert Trout was responsible for setting up the exhibit. Several members floated in and out of the area as different topics of discussion changed, and other exhibits caught people's eyes. All the members had their copies of KM, and all declared an eagerness for each new edition. *Ed: Well done Brian for flying the flag for the Guild. Also on your new job in sunny Florida. How about an article on what you do aboard ship.*

## Notes From The Secretary's Blotter

I am sitting here looking out at the sun shining on the garden, and thinking, why am I sitting indoors writing this - - - . That was how I opened the last set of Notes, but it was summer then. Today brings us on into November, and although the sun is shining we do have the first real frost of the winter. It feels as though the summer was so short after last years long winter, which didn't seem to leave us until well into June. I suppose that the only advantage of a long winter is that it gives us time to sit down and tie a few more knots.

Now that I have learnt to tie the odd Turks head, ( and mine can be quite odd), it amazes me how everyone looks to see where the ends are. They are of course just tucked out of sight, so that you can't see the join. Hopefully nobody could 'see the join' when I closed the office for a fortnight in order to decorate it. I have now lived in my present house for five years,

and it was the one room which I had knot tackled. I wonder why? It is only ten foot square, (i.e. 3m x 3m) which is not large, but it did take half a day to empty it. Now that it is all back together again, I hope that I shall be able to find everything.

This waffle is all very well, but what about the Guild I hear you ask yourself. Well since I last wrote we have exhausted our supplies of Knotcraft, by Stuart Grainger, and Nylon Novelties by the late Eric Franklin, the entire print run of the latter having sold out in less than eighteen months. Both have been reprinted, the latter having been corrected following the discovery of one or two minor draughting errors. In both cases, as the publisher, the Guild collects all the profits from the sale of these books, which in the case of Knotcraft, is now well into four figures. As for the rest of the stock, just have a look at the inside cover of this KM for the full list. Telephone orders can be taken, by just quoting your plastic card number and we are in business.



Whilst on the subject of books, recent additions to our book list include Concerning Crosses by Brian Field, (price £1.50), and The Fender Book, by Colin Jones (price £9.95).

Apart from all the mundane yet essential administration, the Council have been investigating the possibility registering the Guilds logo. This could be expensive, but perhaps necessary if we wish to protect our public image.. On a similar vein, we are looking into the creation of a Guild Flag, for display, or even to be flown at our meetings. Although the flag is not beyond our means, the formal registration is not cheap. No decisions have been made on either of these items yet.

Arrangements have been made to book venues and dates for the AGM and Autumn meeting next year. Just to make it easier, all known information on these meetings can be found in the latest edition of the membership handbook - which I must write as soon as I have finished this little literary masterpiece, and which I am hoping will be in the same envelope as this -

*unless it isn't - in which case it will follow shortly.*

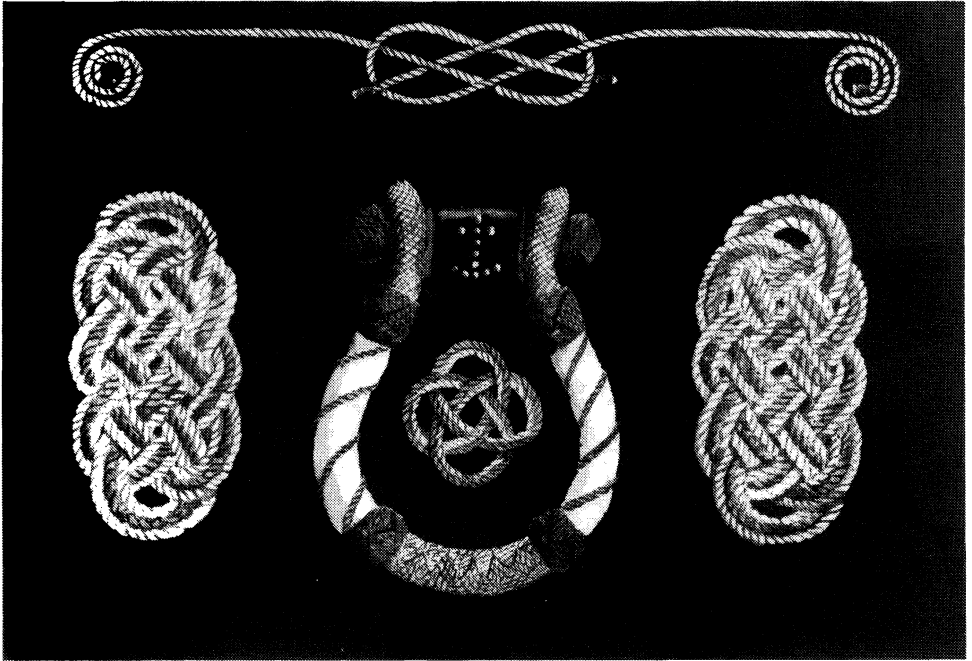
We have been thinking about the Constitution, which was last subjected to some minor changes in May 93. It has been suggested that Council Members should have a longer period in office, say three years, but with a limit on the number of consecutive periods of office, for example two. The idea being to provide some continuity, reduce the number of 'volunteers' for election each AGM, reduce the long term commitment on any individual, in this example six years maximum, and encourage fresh blood. Should you have any thoughts on this, or any other aspect of the Constitution, do let me know, fairly quickly, as the mechanism for dealing with this is time consuming, and time is short, if changes are to be put to the membership at the next AGM.

Very soon, if not already, the Millennium will be less than three years away, that is assuming that you are looking at the years when everyone will be celebrating, - rather than the

first day of the next millennium, which is really a year later, according to the experts. All that aside, if you have any thought on how, occasion should be marked, do write to me, or Lonnie, so that we can all get in on the Act. I will take this opportunity to mention 'The InterKnot' - now that I have mentioned it, watch out for it in future editions of KM. That brings me round to the Internet, e-mail, faxes and all that. In the latest edition of the Membership Handbook, a new section has been included, listing e-mail addresses. At present this section is very short, however, I am assured that this is the way forward. If you are not there let me know and I will add you to the list ready for the next edition, which is due out in about 12-18 months. If there is sufficient interest, I can even arrange for a supplement to be issued in Knotting Matters. its all down to you.

For those who are interested, as yet None of the Guilds computers are connected to it, however for those wishing to

communicate with either myself or the Council, Gordon Perry has offered his own facility as a contact point. I also know that there are others out there who are connected, and who are not only spreading the 'Word' but are attracting new members. It all seems so amazing to me, especially when my son, who is in Sheffield, tells me that he is in regular communication with one of his many girlfriends who lives in Chicago. At least it is reducing his telephone bill, (which dad has to pay).I have not yet mentioned the Autumn meeting in Rotterdam, which I thoroughly enjoyed, as did all the others who attended. Our thanks go to all those Dutch members who helped in any way to organise, and in their various ways, make our visit so memorable. A full report of the meeting I am sure will appear elsewhere. However, for now I must close. Best wishes for Christmas and the New Year -



The latest from the Supplies Secretary:-  
"A Seaman's Chest" Greeting Card by Garth Allan  
with no message  
Price with envelope 75p or mounted ready to frame £2

**BOOK REVIEW**  
***SYMMETRIC BENDS***  
 by **Roger Miles**

Lester Copestake writes:

Symmetric Bends, eye-catching title for this trim, black volume on the table at the IGKT 14th AGM in the training centre at Gilwell Park. But the place and Charlie Smith created to much fun and diversions. A quick look and I put the book down knowing I had to get my own copy. I got my own copy and the next day I am asked to do a review. How to begin!

This is not so much a review as an appreciation of the 90 coloured drawings of the 60 chosen bends and some 70 ingenious diagrams on a square lattice revealing the open structure of knots. From these it is easy to be sure of tying accurately. It's so full: knot studies growing out of it will engross us all, even leaving out the maths. You are left to devise your own practical methods of tying each one. This alone will keep you happy for ages. but there is more.

He shows that bends are uncountable but has picked and photographed in colour his

“best” 60. Some need two aspects to show off the symmetry, over 90 views. The hints on how to invent new ones for yourself and record the structure in diagrams like fig 1 will be the meat of the book for

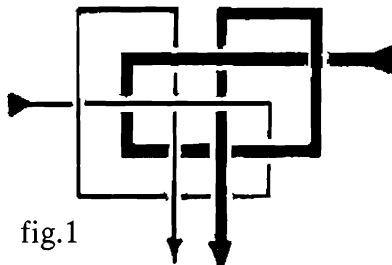


fig.1

most of us.

Don't we all want to get a good new one to write to Knotting Matters about. These 'e-diagrams' are far easier to draw and read than an ordinary sketch

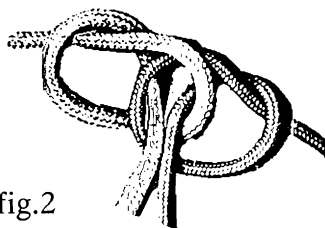


fig.2

like fig. 2.

Fig.3 shows two aspects of the bend drawn up ready to photograph (he tells you the

exposure) and fig 4 is the four stages on the method of tying.

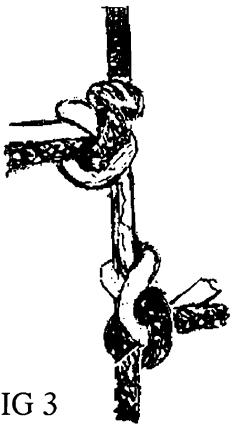
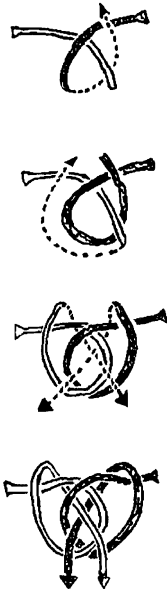


FIG 3

There is a paragraph on each bend, usually omitting tying methods. Fig 4 illustrates the authors wisdom in avoiding a



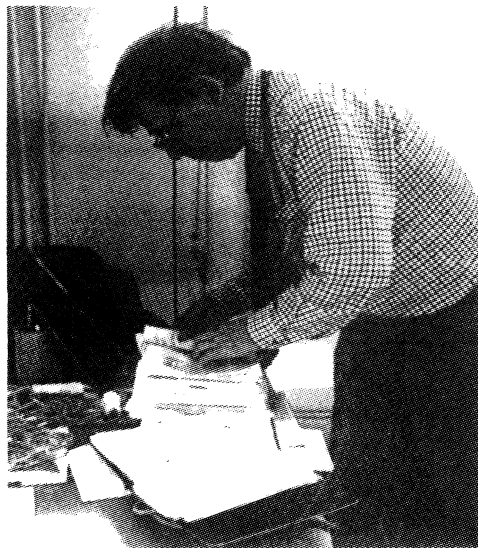
field where every knot tyer thinks he knows best.

Tiny changes make new bends. That's why there are so many waiting to be discovered and why Roger Miles' methods seem such a great aid to knot tiers. You can devise your own diagrams. Discover a new bend. Start using pencil on the lattice. He gives lots of hints. Finally you can look for a slick way to tie it. The author asks you to write and tell him of any good ones that you turn up. Why not also write in triumph to *Knotting Matters*. Indeed why not? This is part of what the Guild is for. Moreover his prose is so conversational and disarming that I forgive him for leaving my favourite bend (the Butterfly knot shown) out of the 60, even if it is "symmetric". But is it? All dictionaries that give the word say it means symmetrical; implying due or just proportion, balance, harmony and more. I would prefer the harmonious term did not the harsh short form suit the difficulty of a concept with many modes. Read on!

Roger Miles quotes Harry Asher's old guild maxim as sat out on page 55 of his most inspiring 'Alternative Knot Book'. "If a knot is symmetrical it is likely to be a good one." Whereunto a mathematician added; "If it's not symmetrical throw it away." A hard notion for the practical man to accept. Besides the Butterfly, the structure is the same as the loop in ABOK #1053, I would add two knots; Tarbuck & constrictor; sundry hitches - timber, buntline, clove & awning, maybe the figure of eight and who needs any other for real rope work?

Of course we need all sorts and qualities in knots. On page 75 he gives a list of the qualities of a good knot, like Charles Warners list in KM41/22 but adds the vital ingredient "Charisma".

I was long out of University by the time new maths came in. But any symbols not explained in the text I have linked up under net theory in an A-level crib. But I am leaving chapter 3 and 4 to last. No need for maths to enjoy this book. All you need is to be a dedicated knotsman.



Lester Copestake at Gilwell Park - May 1996

\*\*\*

Sorry there is no diary this time, our diarist Jeff Wyatt has had to bow to the call of house decoration, and has not had the time to compile one. The previous one goes quite far into the future anyway, these dates have probably not changed too much. Look forward to hearing from you next time Jeff.

## KNOTS WITH BOWS AND STERNS

by Sten Johansson, Sweden

Looking at the enclosed list of 114 knots, isn't it amazing that they have travelled more than 250,000,000 nautical miles without being untied or retied, just washed. Some of them are still getting wetted.

"The following ships were built for the US Maritime Commission during World War II 1945-45, The ships were classified as C1-M (Cargo ships under 12 passengers) and the main dimensions were: 38ft 6in length OA, 5032 DW tons, Diesel engine of 1750 BHP (a total of 239 ships of this class were built).

Acorn Knot, Anchor Bend, Anchor Hitch, Becket Bend, Becket Hitch Bell Ringer, Bight Knot, Blackwall Hitch, Boatswain's Hitch, Bowline Knot, Buntline Hitch, Cable Eye, Cable Splice, Capstan Knot, Carrick Bend, Cat's Paw, Chain and Crown, Check Knot, Cinch Knot, Clove Hitch, Crossing Hitch, Crossing Knit, Crown and Diamond, Crown Knot, Diamond Hitch, Diamond

Knot, Double Loop, Dragon Fly, Emerald Knot, Fiador Knot, Fisherman's Bend, Flat Knit, Flemish Knot, Grass Knot, Gunner's Knot, Half Hitch, Half Knot, Hawser Bend, Hawser Eye, Hawser Splice Honda Knot, Hook Hitch, Horseshoe Splice, Irish Splice, Jacob's Ladder, Jumper Hitch, Knob Knot, Lanyard Knot, Leader Loop, Lever's Bend, Link Splice, Lock Knot, Long Eye, Long Splice, Loop Knot, Magnus Hitch, Maiden's Eye, Mainsheet Eye, Manrope Knot, Mariner's Splice, Marline Bend, Marline Hitch, Marlinespike Hitch, Masthead Knot, Mesh Knot, Mooring Hitch, Mooring Knot, Ocean Plat, Persian Knot, Phoebe Knot, Reef Knot, Reeving Eye, Rigger's Eye, Ring Hitch, Ring Knot, Ring Splice, Roband Hitch, Rolling Hitch, Rose Knot, Round Splice, Running Knot, Sailmaker's Splice, Sailor's Splice, Salmon Knot, Sampan Hitch, Shamrock Knot, Sheepshank, Sheet Bend, Short Splice, Single Hitch, Sinnet, Snakehead, Snug Hitch, Solid Sinnet, Span Splice, Spanish Bowline, Spar Hitch, Spindle

Eye, Spool Sinnet, Square Knot, Square Sinnet, Star Knot, Sword Knot, Tag Knot, Tapir Splice, Terminal Knot, Thimble Hitch, True Knot, Tucked Bend, Turk's Head, Wall Knot, Water Knot, Yard Hitch.

I wonder where USMC got the names from. It could be Ashley, but Ashley's Book of Knots was not published until 1944 and not as a public edition until late 1944 or early 1945.

I am a little confused by some of the names, Acorn Knot, Chain and Crown, Jacob's Ladder. The latter I do not recall as a knot, but as is mentioned in Ashley's index only as Jacob's Ladder, it could have been taken for a knot, Acorn is a small ornamental piece of wood above the masthead valve to prevent the latter from being blown off, but why an Acorn Knot? I cannot find it in any book. What is a Chain and Crown?. Tapir Splice must be wrongly spelled, shouldn't it be Taper Splice or Tapered Splice? I am looking forward to your comments.

\*\*\*\*

**RE:SNIPPET FROM AN E  
MAILMESSAGE  
RECEIVED BY TERRY  
RIDINGS.**

by Owen K Nuttall -  
Huddersfield, England

Lambshank, Sheepshank, I would like to add my Ramshank to the menu.

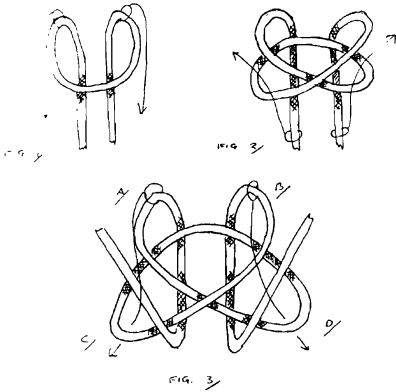
The question was why is a Sheepshank a relatively useless knot? No knot is quite useless. If all knots were perfect how could comparisons be made of each knot's capabilities.

Quote from Ashley on Sheepshanks. "The Sheepshank with Marlinspike Hitches is the safest of all Sheepshank knots. All other varieties should be seized or otherwise secured to make them safe unless the need is very temporary."

My Ramshank is a beefed up type of Sheepshank and it is the only type of Sheepshank tied on a bight, where the two knots at each end are not dependant on each other. Spill one and the other one will hold. This cannot be said of any other type of Sheepshank tied on a bight. Even the Sheepshank with the Marlinspike Hitches chickens out on this test.



The Sheepshank often gets a roasting for being useless, yet wagon drivers have for years used half a Sheepshank as a Dolly knot and still use it today. The Sheepshank is also used by the Merchant Navy.



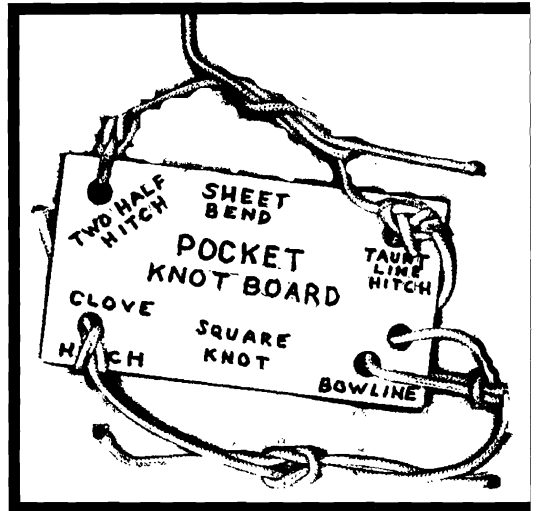
COMPLETED RAMSHANK

To tie the Ramshank, double back the bight over the two standing parts. Take the two loops down again over the standing parts.

Separate the two legs so they are parallel then bend the two standing lets across the two bottom loops. Put loop A through C and B through D. Hold Loop A and B with thumbs whilst pulling the standing parts in opposite

directions until the knots hold, then pull tight to complete the Ramshank.

\*\*\*



**A tribute to Gus Erickson  
(Gus' death was sadly reported at the May AGM)  
from Richard Hopkins -  
Bristol, England.**

Here is a copy of the 'Pocket Knot Board' that I was sent by Gus just over a year ago.

He got the idea when taking his Scout Commissioners training course at a camp in New Mexico. The original was of board, about 2' by 3', used 1/4" cord, and was a useful training aid. A message might be put on

the back and the board presented as a souvenir or prize. When reduced to the size in the picture or even a little smaller it is a convenient size to paste a visiting card on to, to ensure that you are remembered. I have used it in this form myself on many occasions.

Gus said that the card he used was the backing card from a picture framer who was happy to save his the offcuts so no great expense was incurred. From other items in his letter he sounded an interesting and practical knoter with a broad range of skills and his death is a sad loss to the Guild.

\*\*\*\*

## **Spherical Turk's Heads from Patrick Ducey - Washington, USA**

I was taught several interesting knots by my grandfather, Louis W Perkins, Radm, Ret. One of these is the spherical Turk's Head, in which the ends of the cylinder are closed. He passed away several years ago, and I have never met anyone else that knows this variation of the Turk's Head. I don't know if I am the only one who knows

these knots, they are not in The Ashley Book of Knots. They are an interesting modification to the common Turk's Head. I know that in the past, the knowledge of how to tie an uncommon or difficult knot was a closely guarded secret, but with the art of knot tying fading into history, I feel that I should publish these variations.

Start with a piece of scrap line about 6' long. Tie a three lead by four bight Turk's Head, (Ashley #1305), and raise it to a seven lead by eight bight Turk's Head (Ashley #1322). This will be the foundation knot, or 'loom' in which the finished knot will be tied. I tape the ends of the small stuff that I work with to make a needle so that it is easier to push the line through the knot. Now, using the material that you want in the finished knot, and starting at the beginning of the foundation knot, follow the line up one side of one lead, to the top of the knot. Then, instead of following the line down the same lead, skip one and follow it down the second lead away, as in (fig 1).



Figure #1

When you get to the bottom of the knot, skip one lead, and follow the second lead away, the same as in (fig 1). Follow the lead up to the top of the knot, and this time follow the same lead down, and at the bottom of the knot, the same lead back up. Then follow the same pattern of skipping at the top, skipping at the bottom, then following at the top, and following at the bottom. When performing the second and subsequent patterns through this knot you will run into the 'skips' from previous passes.

When you do, you must follow the over and under pattern of the knot. That is, when coming to the top of the knot, if the last crossing was an under, when crossing a previous skip going up, you must cross over it. This pattern will repeat itself four times in an eight bight Turk's Head. On the last pass, you will cross two previous skips, one

will be an 'over' one will be an 'under'. When arriving back to the starting point, pull out the foundation knot, and the remaining knot will be seven lead, by eight bight Turk's Head with closed ends. The line can then be doubled and tightened securely around a ball.

There are many applications of this spherical variations. It can be used whenever there are an even number of bights in a Turk's Head. I have used the variations twice in the same knot, closing a twelve bight Turk's Head into six, and then three bights. If you want to be very daring, you can use the method of tying a Turk's Head as in Ashley #1331 and make a pear shaped knot. Each time you skip, take a turn in the line and continue as in the instructions. This makes a very nice knot covering that I use for bell pulls.

I don't tie pear shaped Turk's Head in hand any more, it's too time consuming. I have created a method using a cardboard tube and some nails. If you would like a copy of these instructions, please send \$4 for postage and

handling to Patrick Ducey,  
19502 14<sup>th</sup> NE, Shoreline,  
Washington, 19502-1112, USA.

\*\*\*\* \*

## **EARLIEST KNOTS?**

**by Roger Carter - NZ**

May I throw a little light on the subject of who tied the first knot.

I would remind readers of the introduction to "The Art of Knotting and Splicing" by Cyrus L Day, wherein he quotes from 'Animal Treasure' 1937, "Gorillas use them (knots) to hold creepers and saplings together in making their nests. Ivan Sanderson once counted two dozen knots in a single nest. Most of them grannies, but three of them were Square Knots". The primates were around before homosapian I think you'll agree. Also, in BBC Natural History Archives is a film about another of the species of birds that tie knots, The Weaver Bird - Plociedae family. In this film which I saw on TV here, the birds build elaborate nests of plant fibres suspended from slender branches of large trees, they look like large cocoons. In the

scene I was vastly impressed with, a bird hung upside down from a branch, hanging on by its left claw, and with right claw and beak it tied a perfect Clove Hitch! as the first move in starting a nest. Since it is well known that birds were around millions of years before the first mammal, don't you think, giving credit where it's due, the question ought to be, what tied the first knot, not who.

Any comments!

and more from Roger.....

Re the clothes line question, when I joined the RN as a boy seaman one of the things we were taught in the first week, was how to dhobi our gear, by a pensioner marine, he gave us short lengths of string called 'stops' with which we secured the corners of our washing to the main line with Rolling Hitches.

Yet more, Roger sends the derivation of our name Boggs, he says it is an ancient Middle English nickname meaning 'puffed up or saucy' the plural 's' means belonging to or son of. So there is some truth in these old name derivations!

Ed: many thanks Roger, once again an interesting contribution from down under (well it is down under if you're in the northern hemisphere like us).by

## **THE OLD ART OF ROPE WORK AND MODERN SIGNAL PROCESSING**

Nils Kristian Rossing

A sailing ship cuts through the sea. There is a moderate breeze and it is time for a rest. A sailor is sitting on a barrel working with a stub of rope. The course fingers of the sailor makes the finest shapes with the simple rope. After a while a work of art takes shape among his hands and a rope rosette is placed on the deck.

A pendulum is suspended from the ceiling. The heavy weight is carried by two cords attached to the ceiling. The pen of glass, which is fastened to the weight, is following the motion perfectly and rushes gently across the sheet of paper which is stretched out on the floor. The weight is making arcs of the finest sort on the paper. The

motion is slow and steady. A lonely spectator sitting by the side of the pendulum spell bound by the curves visible on the paper. After some time the pendulum settles down and the curve is tied up in a single point at the centre of the drawing. A beautiful pendulum drawing lays on the floor.

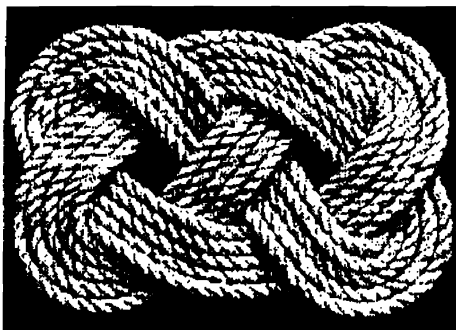
It is late in the evening, an enthusiastic scientist is sitting by his computer meditating on a mathematical problem. An untidy time function steps forward on the screen. He presses a couple of keys on the keyboard and the computer starts analysing the signal. After a few seconds the time function is transformed into bars in a diagram and suddenly some of the inner secrets of the function are revealed. The computer screen shows, in sharp contrast to the dark background, a signal spectrum.

Does there exist a common denominator between these three so very different disciplines? Let's take a look at these three subjects.

## Pendulum drawing

By suspending the cables of a pendulum from two points in the ceiling and then leading the cables together in a point between the points of suspension and the weight, it is possible to make the pendulum oscillate with different frequencies in two directions perpendicular to each other.

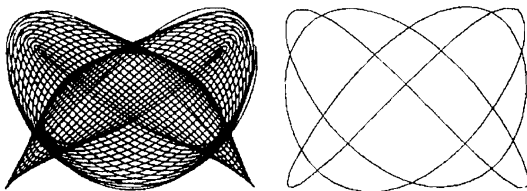
The point where the cables are tied together can be moved up and down. In this way it is possible to change the frequency ratio between the two oscillations and a great variety of figures can be created on the paper. These figures are called Lissajous figures after the French physicist Jules A Lissajous (1822-80).



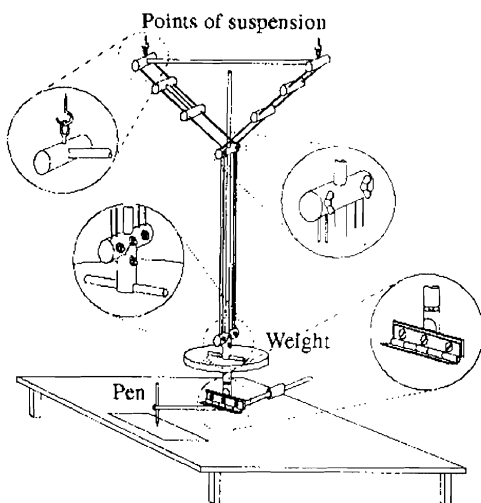
Kaj Lund, "Matter og Rosetter", Borgen 1968

## Mats of rope

The Danish cordage artist and

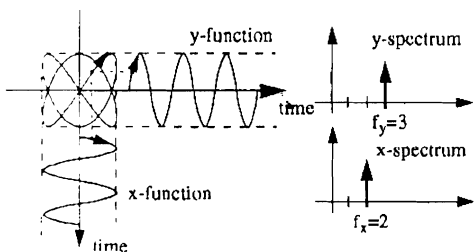


*Examples of Lissajous figures drawn by the pendulum drawer writer Kaj Lund has in a number of years collected and recreated old rope mats and*



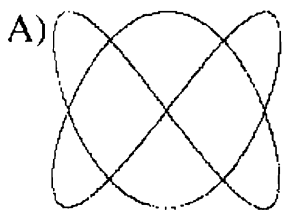
knots. Some of them can be ascribed back to the time of Vikings. One of the simplest models is the square mat shown in the figure (left). As we can see from the picture, the square mat and the Lissajous figure have almost identical shape.

The mathematics of Lissajous figures



Mathematically the Lissajous figure can be expressed by two equations:

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



$$f_x = 2, f_y = 3$$

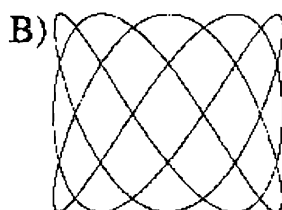
$$y = A_y \cdot \cos(2\pi f_y t + \varphi_y) \quad (2)$$

Different Lissajous figures can be obtained by changing the ratio between the two frequencies,  $f_x$  and  $f_y$  (see diagram below). The shape of the Lissajous figure may be changed by the amplitudes  $A_x$  and  $A_y$ ,  $\varphi_x$  and  $\varphi_y$  are the phase of the two oscillations.

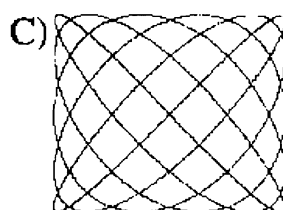
As for other oscillations it is possible to represent Lissajous figures with two spectrum, one for the x- and one the y-function.

## Square mat

We have observed that the Square mat and the Lissajous figures are almost exactly equal. For this reason we may represent the Square mat with the same mathematical expression as we did for the Lissajous figures. The figure below shows some examples of simulated Square mats. The shape of the mat is, as for the



$$f_x = 3, f_y = 5$$

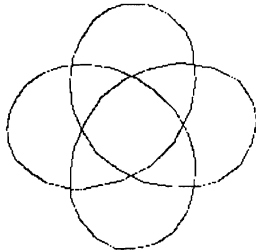
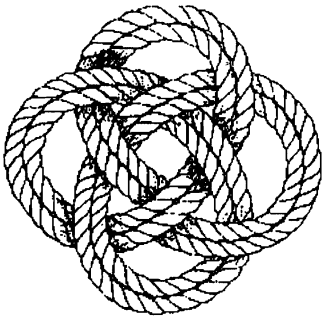


$$f_x = 5, f_y = 6$$

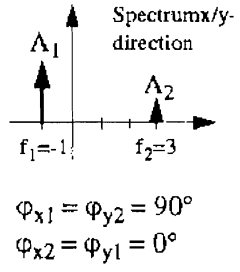
Lissajous figures, mainly determined by the ratio between the frequencies,  $f_x$  and  $f_y$ .

However, the Square mat is one of the simplest mats.

**Turk's-Head rosette**



Four-Bight Turk's-Head



2. Clifford W. Ashley, "The Ashley Book of Knots", Faber 1979

A natural question is now if it is possible to find equations describing more complex mats.

Let's take a look at the Turk's Head<sup>2</sup>.

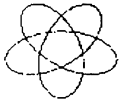
The starting point could for example be the Guild's mark which is a Four Bight Turk's Head. By a little bit of experimenting it is possible to find the mathematical expression for Four Bight Turk's Head;

$$x = A_1 \cdot \cos(2\pi f_1 t + \phi_{1x}) + A_2 \cdot \cos(2\pi f_2 t + \phi_{2x}) - (3)$$

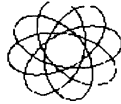
$$y = A_1 \cdot \cos(2\pi f_1 t + \phi_{1y}) + A_2 \cdot \cos(2\pi f_2 t + \phi_{2y}) - (4)$$

As we can see the expression contains two frequency components in each direction,  $f_1$   $f_2$ . However, these two components are equal in both the x and the y directions. By manipulating the two frequency components, it is easy to make more complex Turk's Heads. The distance between the two frequency components reflects the number of bights. By changing the distance between and location of the frequency components we can get several variants of the Turk's Head rosette as shown in the figure below.

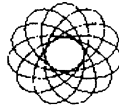




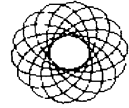
$$f_1 = -2 \quad f_2 = 3$$



$$f_1 = -3 \quad f_2 = 5$$



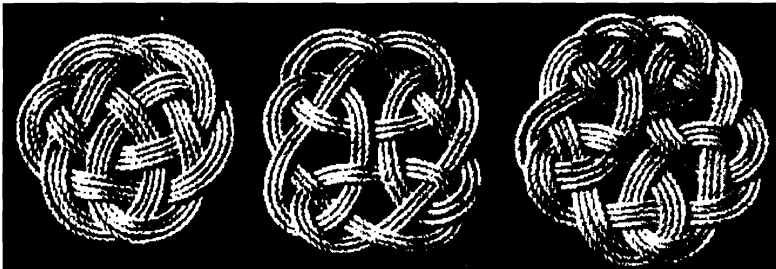
$$f_1 = -4 \quad f_2 = 7$$



$$f_1 = -5 \quad f_2 = 9$$

Let us now go one step further and look at even more complex mats.

The Twisted rosette (Overhand knot rosette) The figure below shows some examples of the twisted rosette.



***Kaj Lund, "Matter og Rosetter" Borgen 1968***

This type of mat is made of three or more overhand knots. The twists of the right mat overlap in the centre. The centre and the left ones do not overlap.

What about these beautiful mats; Is it possible to find mathematical expressions for them? The answer is yes. But

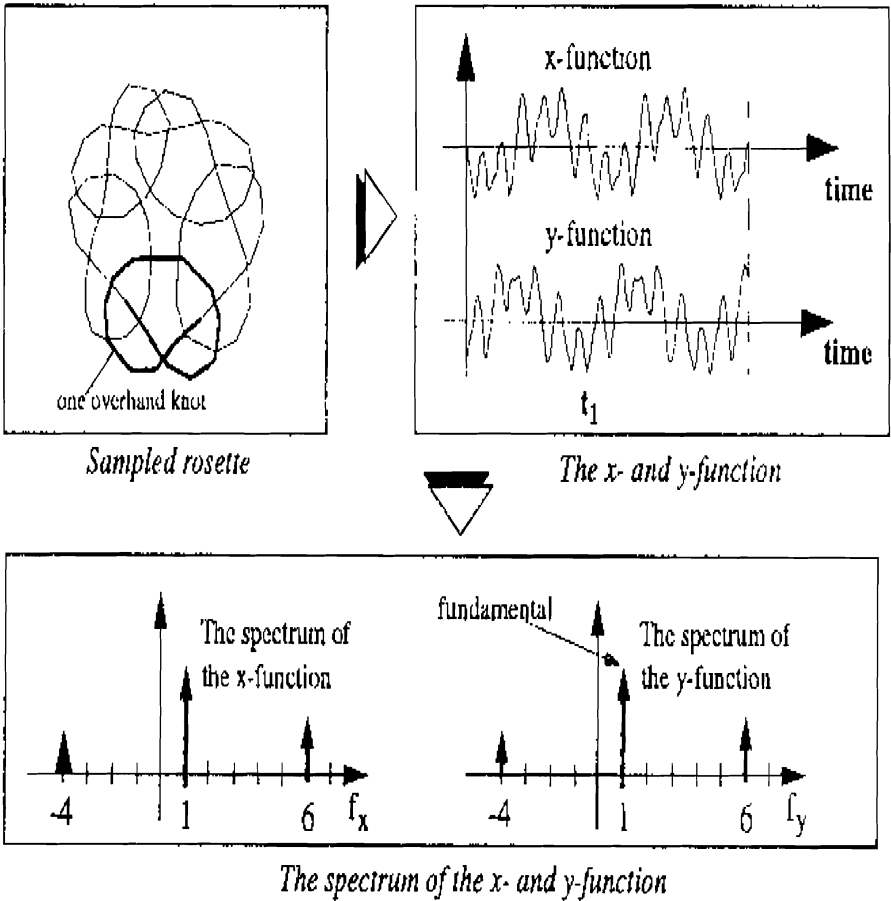
is not simple and we had to use a mathematical tool called Fourier analysis to find the number of frequency components and the value of the different parameters.

To do the analysis we first of all

had to transfer the rosette to a transparent overhead foil. The foil was put into the computer screen and sampled by a program called Matlab. In this way the curvature of the mat was transferred to a series of numbers in a co-ordinate system inside the computer. From these sets of numbers the computer could draw the x and y function. The spectrum of the x and y function was

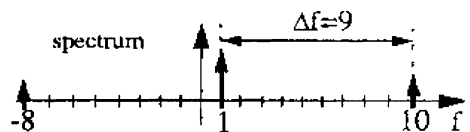
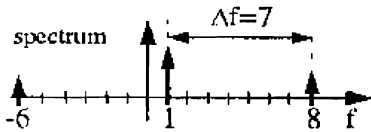
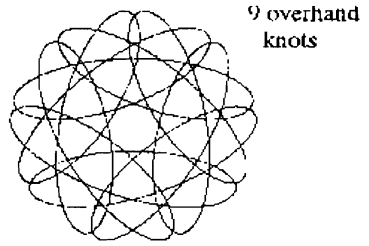
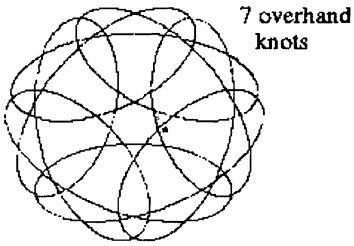
determined by doing a Fourier analysis of the two functions.

The distance between the components is 5 and equal to



The mat in the example above is made of five overhand knots. From the x and y spectrum we can see that this mat can be described by three frequency components with its special amplitude and phase values.

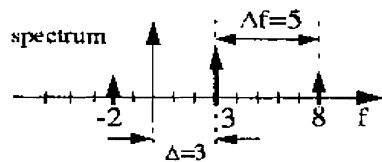
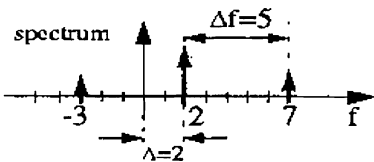
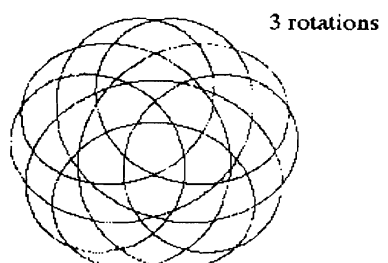
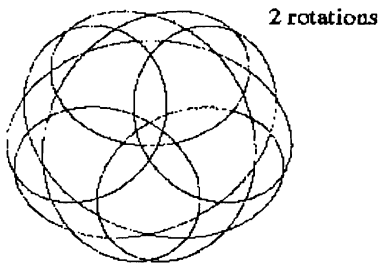
the number of overhand knots (twists) in the rosette.



*The number of overhand knot is similar to the distance between the frequency component in the spectrum*

It is now easy to experiment with the parameters of the mathematical expression. By changing the amplitude values, the distance between the spectral components of move, the spectrum to the right or left, we may find new variants of the mat which can be drawn

on the computer screen. The figures above and below show four variants of this type of mat.

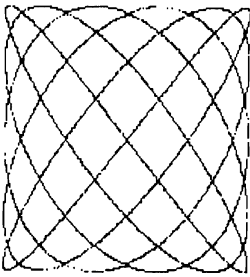


*The fundamental frequency of the spectrum is equal to the number of rotations round the centre of the mat*

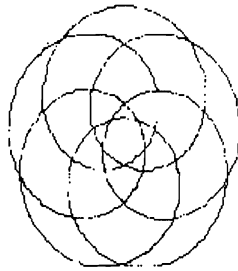
**Mats of different order**

Since the Square mat can be described by one frequency component, I have called this class of mats *mats of first order*. In the same manner I say that a Turk's Head rosette is a mat of

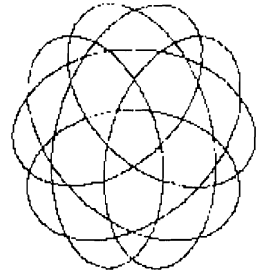
*second order* and a twist rosette is a mat of *third order*. Using the Fourier technique it is quite easy to analyse mats of higher orders. The figure below presents some examples.



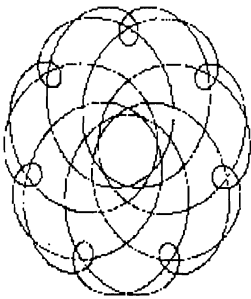
*1 order Square mat*



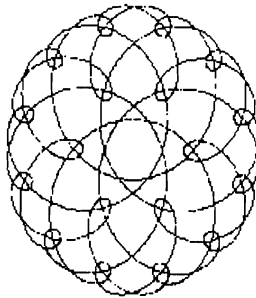
*2. order Turk's-Head rosette*



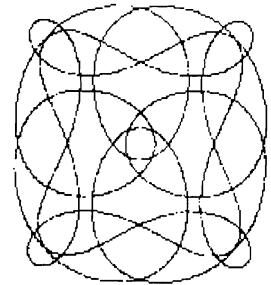
*3. order Twist rosette*



*5. order Simple eye rosette*



*8. order Jens Kusk Jensens rosette*



*9. order alternating eye rosette*

The figure above shows traditional and new rosettes of 1,2,3,5,8 and 9 order generated mathematically.

In a later article I will discuss mathematical descriptions of three dimensional knots and cylindrical chains.

I would be pleased to know if anyone has worked with related techniques for mathematical analysis of rope mats and rosettes. I have recently finished a book on the subject and am interested in comments on these techniques.<sup>1</sup>

Nils Kristian Rossing, "Mathematical description of rope work", 1996, 234 pages.

(Nils Kr Rossing, Bromstadekra 11B, 7046

Trondheim, Norway,

e-mail: nils.krossing@informatics.sintef.no).

Fax: +47 73 59 26 96

**AN EXAMPLE OF  
MEMBERS FROM THE  
INTERNET**

Ms Pat Flanagan - Athens  
Georgia - USA

This summer I learned to use the Internet at the University of Georgia in Athens, where I work as a classical music announcer for their radio station. I decided on a lark to

enter the word knotting and press search. I didn't expect anything. I've been exploring macramé and decorative knotwork since the 1960s for my own pleasure but never found anyone who shared my interest. Therefore, I was absolutely delighted when the information on the International Guild of Knot Tyers popped up.

I want to join your group and get your newsletter as soon as possible, with a mind to attending one of your conventions sometime in the future, and possibly corresponding with some of your members about their ideas and projects.

I taught myself macramé back when I was a hippie girl and made vests and belts but I soon wanted to do more so I began studying decorative knotting in Encyclopaedia of Knots and Fancy Ropework by Hensel & Graumont and the Ashley Book of Knots, my two 'bibles' for self instruction. The beauty and intricacy of knotwork has held my interest for several decades as recreation, artistic outlet and just plain fun

These days I'm doing what I call micro macramé. Since this art is on the downside of its cycle and considered almost cliché in some circles because of too many tacky lampshades and room dividers, I decided to update it by making single small designs for pins or string ties. I wear them on my business jackets or with formal shirts. People comment on them and don't even realise there are macramé. Designs called 'mats' by Hensel & Graumont also serve beautifully when mounted on pin backings or suspended from a sennit in complimentary colours around the neck.

Another application for creative knotting I'm doing these days is ornamental handles for gift bags. I don't know if this fad is going on in the UK but in America its become popular to buy colourful paper bags for presents instead of gift wrap. These bags have equally colourful but plain string handles secured by simple overhand knots. I remove the original string and knot up a lovely sennit for the handle and finish off with a stopper knot

and tassel. Talk about eye catching!

My most bizarre exploration these days is using recycled plastic bags in many colours for string. America unfortunately is full of plastic bags, at the grocery store, around the daily newspaper, as shopping bags and they are often in lovely primary colours. I discovered that if you cut these bags into long one inch strips and roll them slightly as you work, you can create the most beautiful braids which added to plastic beads make a creation that no one suspects is a recycled baggie. Clear plastic bags by the way when rolled and braided have an appealing silver sheen you'd never see otherwise.

The last aspect of knotting that I've been exploring is adding sailor's knotwork to rustic furniture. Again, I don't know if its popular in Britain but furnishings made from sticks, twigs, peeled and unpeeled tree limbs are quite the thing here. I've made a few small experimental pieces which I lashed together instead of nailed

and I embellish them with Turk's Heads and decorative ropework copied from ships. The effect is quite nice, kind of nautical country decor but I have only had time to do just a few pieces.

Radio broadcasting has been my profession for some twenty years but knotting has been my recreation and inspiration for thirty years, a delightful switch to working with my hands from running my mouth.

Your web site states you have 600 members and I'm hoping some of them are Americans who might like to correspond with me about their activities and projects. I'm also somewhat of an Anglophile as I listen to BBC World Service regularly and I would love to make some new friends in the UK too.

So I ask you to sign me up as a new member and feel free to distribute my address and phone number. I do not have an electronic address as yet but I probable could be reached through the e-mail at the University of Georgia.

Again I am so excited about being able to communicate with people of similar interests about my love of knotting. I look forward to hearing from members of the International Guild of Knot Tyers soon.

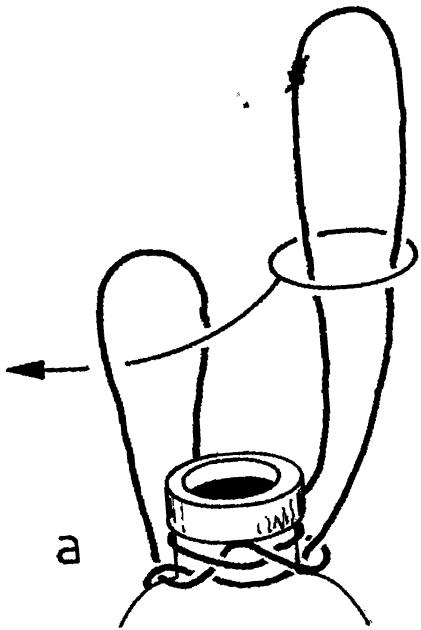
Ms Pat Flanagan  
189 Hidden Hills Lane, Athens  
GA 30605 - USA

Ed: Who says the Internet has no use, here is at least one member gained.

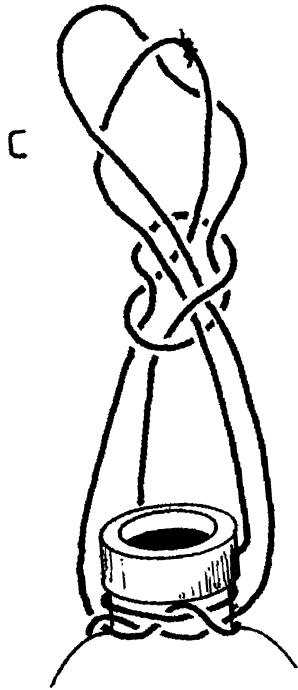
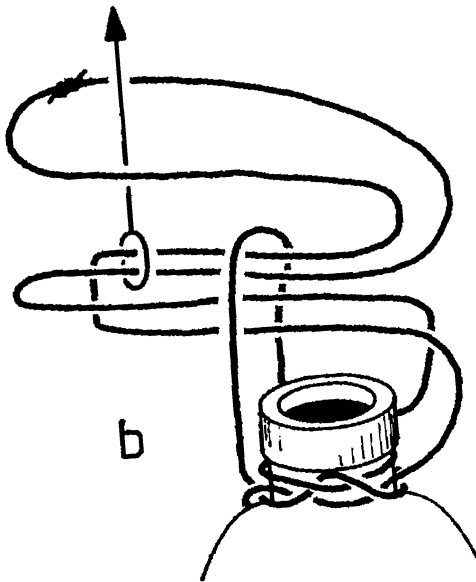
**FROM OUR  
KNOTMASTER SERIES  
ASHER'S EQUALISER**

You have tied a Jug, Jar or Bottle Sling. The usual advice is to make both loops (handles) the same length. That's not necessary. In fact it's better if you don't.

Knotmaster No5 shows a simple way to even them up. Here, also from Dr Harry Asher in 1983, is a cleverer version.



# Asher's Equaliser





## WHY NEW BENDS?

by Owen Nuttall

Why more new bends when most people can get by with just a few basic ones. With a handful of bends we can join together most things from cotton to ropes. A thumb knot for sewing with cotton, a Reef knot in "string", a Sheet Bend in rope, though a knotsman would use a Carrick Bend. With the above mentioned knots we could get by in most everyday situations. The most important thing in tying any bend is the ability to tie quickly and confidently, knowing that the bend is secure. Finding a bend to use is a matter of personal choice.

I like to invent new ones to stimulate my interest in Knotting. Though the best bends will hold their own, a lot of satisfaction can be gained from tying new ones to add to ones repertoire.

There follows a series of three articles on bends which are simple to tie, to ones that are purely decorative. Even though the decorative bends hold up well, they would be impractical

for a working environment, but they make useful knots to put on a Knot Board, or as the late Harry Asher called them "Broach Knots".

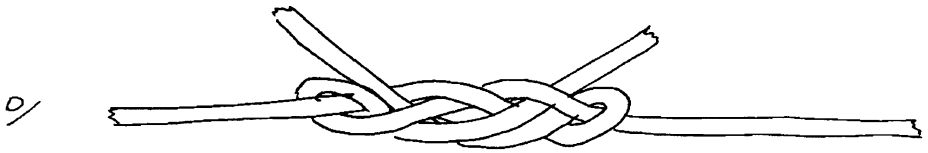
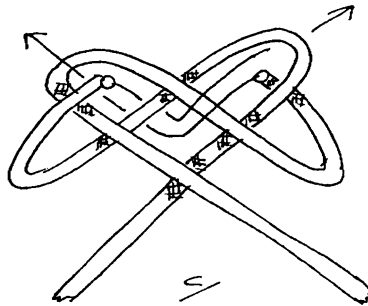
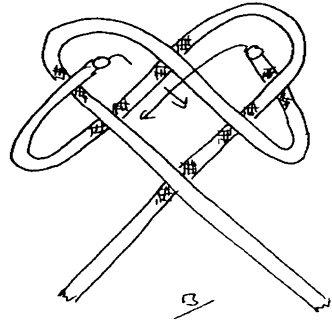
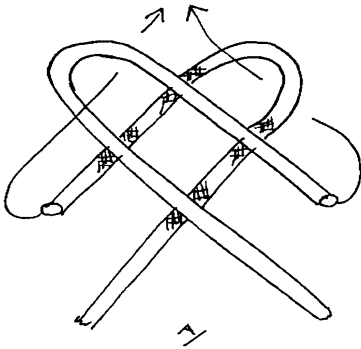
The first one, The Samurai Bend, is an easy knot to tie after a little practice, and when tied following moves A,B,C, and making sure it resembles tying shown at D before finally tightening. What I like about this bend is that the standing parts are not subjected to a lot of sharp turns, so the working load is transmitted throughout the full length of the bend and is relatively easy to untie.

The Second Bend (Figure Three) Folded Arms. This is an easy knot to tie, though this knot seems to have a lot of crossing points (open up the completed knot) when pulled up tightly it is neat and secure. This knot is not an interconnected overhand bend. The Third Bend (Figure Three) Handsome Bend (named after many happy days spent fishing in the company of skipper Frank Vinicombe of Falmouth). This is relatively easy to tie. Before finally tightening, make sure that the two outside bights

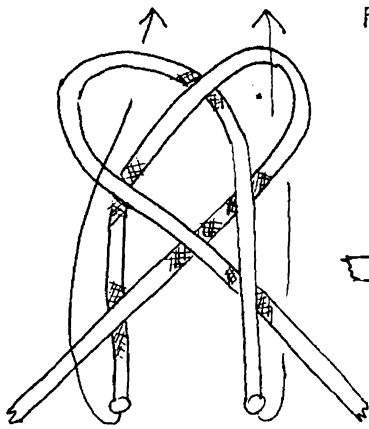
sit on top of the knot, then pull up to complete this bend. With the two working ends on top this bend has a fairly

streamlined shape and has less tendency to snag if drawn over a pulley.

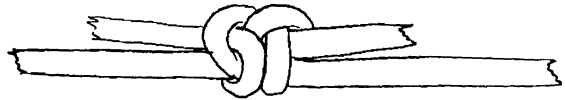
SAMURAI BEND ( FIG ONE )



COMPLETED KNOT

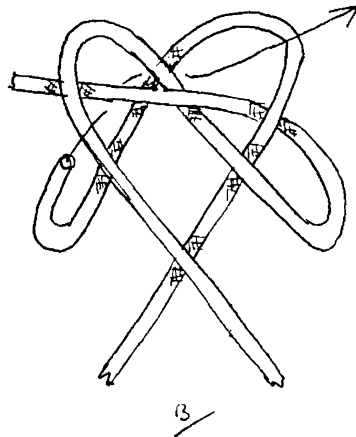
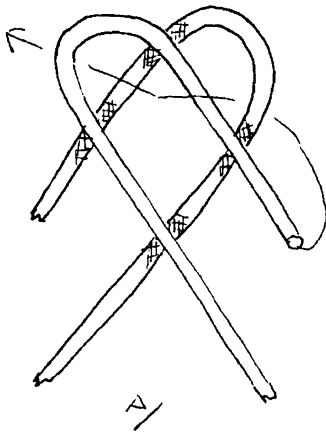


FOLDED ARMS. FIG TWO



COMPLETED KNOT.

HANDSOME BEND. FIG THREE



COMPLETED KNOT.

## **News from our West Yorkshire branch:...**

**from Graham Smith**

### Sowerby Bridge Canal Festival

The branch attended the Festival which included the opening of the new Tuel Lane lock which connects the Rochdale canal with the Calder & Hebble Navigation. We ran the knotting base for the Waterways for Youth scheme and had about 500 kids through by the end of the three days. All of them had to tie at least one knot and identify two others. Lots of people stopped to look at our display of work, ropemaking and fendering. As always we had lots of new information passed on to us by various tradesmen and boaters. It was a real pleasure talking to them, there is always something new to learn.

One elderly gent took me hook line and sinker with question "Why wouldn't you tie up your boat with a Snowball Hitch?" Answer: "Because they melt and it will drift away."

### Colne Valley Museum Craft Weekend

We were asked to attend a craft weekend at a small local

museum in Golcar near Huddersfield. After donning Victorian costume we put on a display of work and had quite a lot of interest from the many visitors. We also spend some time talking to the other craft workers who used knots in their work. These included Tatters, Lacemakers and rugmakers. The museum was producing home baked bread and before the weekend was over we had Carrick buns, figure of eight loaves and half knot bread cakes!

It was here that we met the only horse hair dresser in the country and had some interesting discussions about horse hair rope and its applications. Some of you may have see the horse tail at the AGM. Another successful weekend promoting the Guild and our work.

\*\*\*\*

### **More on the HQ discussions at the AGM: from Colin Grundy...**

During the Guild AGM at Gilwell, discussion was held on the setting up of a Guild HQ. Whilst I agree the idea of

having a place of our own may be a very good idea, I offer a few comments before we go down that path.

Certainly our own HQ would give us a place to not only store, but also display much of the work that has been accumulated by the Guild. A place where not only students of knotting but also members of the public may come a view and study the world of rope. Perhaps if it is large enough, we could also hold meetings and workshops in our own place.

Where though do we site it? In the UK perhaps? At least half of our members are from the UK and it was in this country that the Guild was founded. Would that suit our overseas members? If so, where in the UK? As a midlander, I suppose I would suggest some where near Birmingham, after all it would be near the centre of the country, well served by road and rail, and there is life north of the Watford Gap!

However, to practicalities. Any premises with suitable facilities are going to cost a lot of money, not only to purchase

but also for upkeep. Speaking from experience, having been involved with a Scout group who have their own Hqs, even with a membership of over one hundred and their families, fund raising is difficult and maintenance seems always left to the few. Perhaps we could pass the costs on to the membership, but would increased subscriptions put off many?

A building or even a boat of our own would also require someone to act as a sort of caretaker. They would need to not only hold the keys, but also be prepared to open up for visiting members of the public, perhaps also operate a gift shop to help offset costs. Would they live locally or on the premises, and would they also require remuneration for their time thus becoming an employee of the Guild? I know there are organisations who do achieve this, for example Pendon Model Railway Museum in Oxfordshire but they have a much bigger following than we knotters.

However desirable our own HQ would be, I cannot help but

*Ed: Obviously neither David Gee nor Richard Hodge has seen this earlier edition of KM, they do of course say that they only think it was the first one as Richard Hodge had been unable to find any more. Where would we be without our reliable founder members knowledge of past KMs to correct us, shame they cannot agree on the time of issue of KM 25 incidentally it was issued October 1988.*

\*\*\*\*

**AN IDEA ON KNOT  
TEACHING FROM  
THE USA**

by Brian A Glennon



Above is a copy of a knot certificate issued by the Massachusetts Institute of Technology's Sailing Pavilion to the children of it's Kiddie Day Camp (ages 6-10); the knots required to earn this little

certificate follow at the end of the article. These are the minimum required knots to sail one of our dinghies. There are several more knots, splices and whippings we require of the adults.

This certificate achieves the desired effect since the children go out of their way to learn these five knots, and ask for more, to earn the certificate.

Obviously their curiosity is piqued as they take the initiative and teach themselves new knots.

The length of time to earn this piece of paper varies from one to two weeks. As the age of some of these kids are still in the single digits, both the learning curve and attention span are low. Yet curiosity prevails as one little girl doggedly spent a week learning the Stunsail Tack Bend after mastering the Bowline.

I hope you like the little certificate and knot sheet. I had a lot of fun teaching both the



**FIGURE EIGHT**  
A stop knot which can be used to keep a line from coming out of a block.

feel that at the present membership levels we cannot contemplate this sort of project. Perhaps one day a rich benefactor will turn up with an interest in knotting and donate the money or premises for an HQ. One can but dream.

\*\*\*\*

### **Another brief piece from Colin Grundy:**

Bewdley Museum in Worcestershire, England hold rope making demonstrations using equipment from the original ropework of John Lowe's of Wribbenhall, the last ropeworks in Bewdley. Demonstrations are occasional, although they will demonstrate if asked and also allow hands on demonstrations. Also they have samples of shroud and cable laid rope, which I am told is from HMS Victory. The museum is located in Load Street, about five minutes walk from the River Severn. Tel:01299 403573. Be sure to mention the Guild if you go.

\*\*\*\*

### **Observations on the Rope Chess Set made by Richard Hodge featured in KM52..**

**from Geoffrey Budworth:**

We look forward to meeting New Zealand Chapter member Richard Hodge sometime and seeing his knotted chess set. He should be told, however, that he is NOT the first to complete such a project. On page 24 of KM 25, October 1988 there is a picture of a superbly crafted one by US member Eric Dahlin of Santa Barbara, California. See also KM21 page 23 for Eric's covered steering wheel.

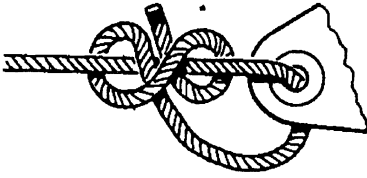
**and from Frank Harris:**

With regard to the article "Knotting problem on chess board" by David Gee. I beg to differ with David Gee as Knotting Matters No 25 published in August 1988 contained a full page photograph depicting a board produced by Eric Dahlin of Santa Barbara, California. The original of the photograph is in the Achives of the Guild and has been displayed at many Guild meetings. My congratulations however, to Richard Hodge on his effort.

to sail and tie knots.

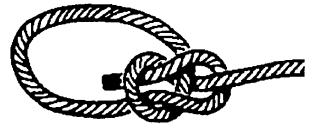
intended for those who have

## KNOTS



### STUNSAIL TACK BEND

Makes the loop in the end of a line which will slip closed, making a neat, tight knot.



### BOWLINE

Makes a loop in the line which will not slip.



### FISHERMAN'S KNOT

A more permanent way to join any two lines - hard to undo. Two simple overhand knots tied around the accompanying line.



### SQUARE KNOT

For tying together two ends of the same diameter

mastered the smaller sizes of

\*\*\*\*

## SIMPLE MATHS HELPS TURKSHEADS

By John Constable - Worcs. -  
England

### PART 1-INTRODUCTION

An interest in making Turksheads almost invariably starts with the tying of a woggle or of simple ones 'in hand' following instructions in a book. Many knotsmen are intrigued by its beauty and some even become addicted to it. This series of notes is

Running Turksheads (Ths) and who want to move on to larger knots and more complex versions. Mathematics and practical knot tying are very far from incompatible. Even the most experienced of tiers will occasionally have to make a small calculation before starting on a knotting project.

All Ths, even the more complex ones, have an invaluable property - that of symmetry. For example the working end of an 'ordinary' TH follows the invariable rule



of 'under over under over etc' and this sequence creates a pattern that permits simple arithmetic greatly to assist its construction.

These notes deal only with Running Turksheads ie those formed from a single length of cord following a regular pattern of weaving and for simplicity all references are to the cylindrical form. Conventional definitions are followed ie a 'Lead' is one complete passage of a cord, or continuously touching cords, round 360 degrees of the cylinder. 'Bights' are the arcs or segments formed at the sides of the knot. 'Times' or a TH is the number of lines or cord running side by side, within a lead, on a parallel and absolutely identical course.

In a formed TH the number of Bights is easily determined but if it has not been perfectly adjusted it can be difficult to determine the number of Leads. The solution is to count the number of Intersections (Overlaps) along a single cord from Bight to Bight and add one. The number of Compartments is given by the

product of Bights times one less than the number of Leads.

There are two horizontal levels of intersections for each Bight and this will be shown in Part 2 to be an invaluable aid in determining whether to cross over or tuck under at an intersection. But when starting a TH the most important characteristic is that the cord, in moving from side to side, always moves forward the number of Bight heights given by dividing the Leads by two, and this is a truly golden rule.

Most of the larger THs appear best when they have been multiplied at least three and preferable five times. Because cord size and timings are critical it is wise to make these the first decision as they will determine the optimum number of Bights. Wrap ten turns of the cord round the object to be covered, using normal final working tension. Measure the width and divide by ten to give the stretched diameter (C) of a single cord. Multiplying this by the proposed number of multiplication's gives the width of a multi strand lead. Multiply this dimension by 1.4

to obtain the optimum height for a Bight. The desirable number of Bights is then found by dividing this figure into the circumference of the final knot which is a cord diameter plus the diameter of the destination and the total multiplied by  $22/8$  ( $\pi$ ). This number of Bights can of course be varied within limits but the calculation does provide the optimum solution before knotting starts.

The number of Leads will now determine the length of the knot along its destination. In Part 4 a method is given for accurately determining the number of Leads to fit that length. This is invaluable when a knot has to fit precisely between fixed points. Turksheads are surprisingly flexible but their good nature should not be strained too far and, of course, the rule of the Common Divisor has to be observed.

## PART 2-CONSTRUCTION

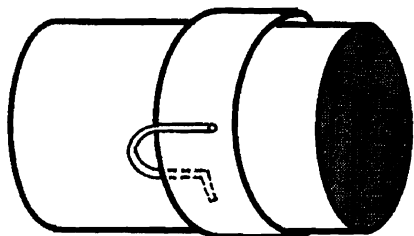
Smaller sizes of Ths can be formed in hand by following the diagrams in most of the books on knotting. Many of them recommend the method of 'raising' to create the larger

sizes. This is achieved by taking the working end round two further circuits of a small knot and repeating the procedure as necessary. The method is of limited values both bights and leads have to be increased by fixed amounts. It can present difficulties as the pattern of intersections, that have to be made, is not regular. Also it is possible to create different sizes from the same original knot depending on whether the additional circuits are started on the near or far side of the standing end. A 3 Lead 4 Bight knot (3Lx4B) can, for example, be singly 'raised' in one operation to either a 5Lx6B or a 7Lx10B knot depending on which of those two paths is selected.

Patterned instructions for larger sized Ths are mechanistic and choice of properties for the knot is therefore limited. There is however, a simple method of absolutely universal application which enables Ths of any characteristics to be constructed and for their intersections to be calculated..

All Ths, other than the smallest, need to have their

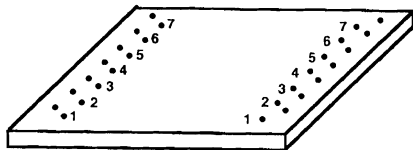
bights temporarily secured during the early stages of construction. If the knot can be slid into its final position then there are advantages in making it on a jig. If that is not possible then bend wire hooks (Fig1) should be secured with adhesive masking tape round the object. Lay the appropriate length of tape, sticky side up, beside a ruler and lay on the hooks at the appropriate spacing.



**Fig. 1**

Jigs of varying size are however, a useful addition to the tool bag of an enthusiast and they can be made from 5mm wood with holes for nails drilled and marked. Wide THs need a wide jig similar to Fig2 and narrow THs need a narrower and taller jig. The holes in the jig need to be drilled so that the nails are a tight fit. 50mm nails are ideal and they have a diameter of 2.5 to 3.0mm. The clear space between nails

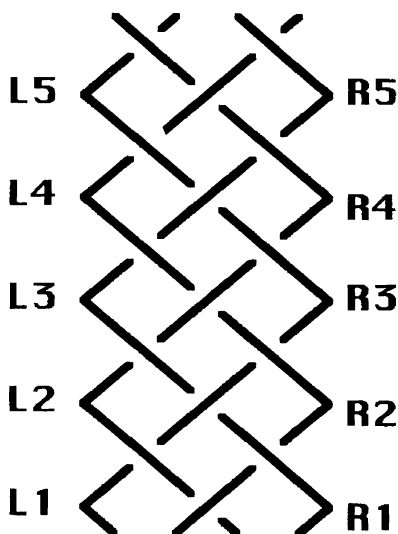
should be about four times the width of the cord to be used. For simple THs only the inner column of holes on the left and the two on the right are used. All four columns are needed when 'scallop edged' THs are being made.



**Fig. 2**

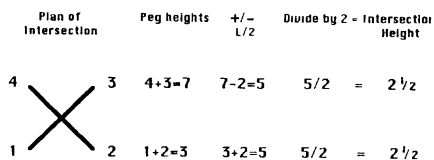
Assuming for simplicity that a 4 Lead 5 Bight (4Lx5B) 'standard' TH, (Fig3) is required and a jig is to be used then the method is as follows. Place nails in holes one to five on both sides for the five Bights. Hold the mid point, of a suitable length of cord, against the top side of peg one on the left side (L1). Divide the number of Leads by two, (the 'golden rule') ie  $4/2 = 2$  and add this number to the peg height each time to determine where to aim the cord when crossing to the opposite side. The first lead it therefore from L1 round Peg 3 on the Right side ie  $L1 + 2 = R3$ . From there the second lead is back across to L5 ( $R3 + 2 =$

L5). There is no peg R7 for the next lead so note where it would have crossed the top of the jig had there been such a peg. Take it over the top at that point, vertically down the back, forward and round R2. It has then moved forward a complete circuit of five Bights plus two ie the required seven spaces. The full sequence of pegs for this single TH is therefore L1, R3, L5, R2, L4, R1, L3, R5, L2, R4, L1 which is back to the starting point. The pattern of the TH is therefore easily established but are the intersections tucks or cross overs?



**Fig. 3**

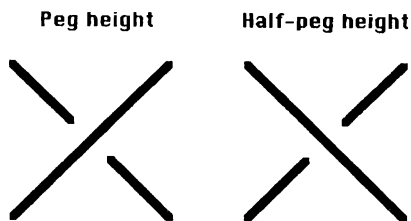
Intersections in the smaller Ths are easily established but a universally applicable method is required for the larger knots and is absolutely essential for the complex twills and scallop edged Ths. The method is easily learnt on the present 4Lx5B. The first junction occurs on the fourth leg from R2 to L4 where the cord intersects the first lead from L1 to R3. The diagram (Fig4) shows that intersection with the numbers of the four terminal pegs to which the cord runs - and it reveals a number of interesting points.



**Fig. 4**

The sum of the top two numbers less half the number of Leads is the same as the sum of the bottom two numbers plus half the number of Leads. This number is invaluable as when it is halved it indicates the Bight height of that intersection; which in this case is 2½ ie half way between Pegs 2 & 3. Now in any regular TH all the

intersections at the same level are invariably of the same type. It is useful to adopt the convention shown in Fig5 ie that intersections occurring at full peg heights are \*/\* whereas those at half heights are \*\\* the opposite.



**Fig. 5**

By this method, no matter how large the TH, it is quickly possible to determine if an intersection at any point is a tuck or a cross-over merely by noting the heights of either the upper two destination pegs, or the lower two original pegs. The method is of even greater advantage when making complex twills, which are THs with a patterned system of intersections, or scallop-edged Turksheads.

When the cord has returned to Peg L1 the first full Lead of the knot has been completed. The nails can now be removed and the knot slid onto its final

location. It should be carefully tightened, leaving sufficient slack for the multiplication Leads which follow round the initial Lead, and duplicate each intersection.

If an odd number of Leads has been selected then all moves forward will include a half and the nails on the right side should therefore be placed in the outer column of holes of the jig.

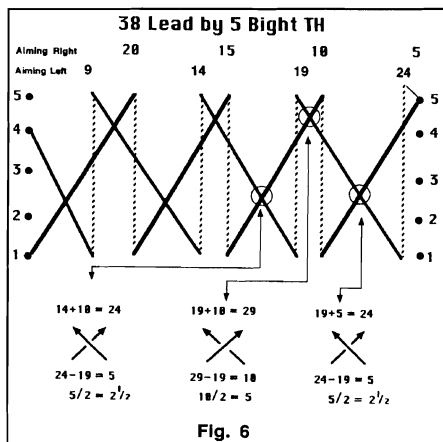
When a wide TH is being made the number of Leads will be greater than twice the number of Bights and each traverse across the knot has to make one or more full circuits of the jig before arriving at its destination peg on the other side of the knot. There is a convenient method for working out the intersections in such cases and that will be described in Part 3.

### PART 3-WIDE TH INTERSECTIONS

In making the 4Lx5B TH in Part 2, the third traverse had to be made from peg L5 to the non-existent peg R7. The solution was to take the cord over the top, down the back of the jig

deducting the five peg heights so traversed from the target peg height ( $2.5+2=7$ ) and moving to peg R2 (ie  $7-5$ ). With wide Ths the cord may need to make several such circuits before the destination peg is reached. To permit the intersections to be calculated it is a useful habit to jot down the sequence of circuits. Using a 38Lx5B knot as an example, the additional Bight height to be added would be 38 divided by 2 ie 19. The start of this knot is illustrated in Fig 6 and the successive imaginary aiming points for the first left to right leg would then be:-

- Traverse1  $1+19=20$
- Traverse2  $20-5=15$
- Traverse3  $15-5=10$
- Traverse4  $10-5=\text{PegR5}$



Do the cord, after three complete circuits of the jig, reaches its destination and turns round Peg R5. The aiming peg, for the return (right to left) leg, is  $5 + 19 = 24$  and the successive imaginary aiming points would then be:

- Traverse5  $5+19=24$
- Traverse6  $24-5=19$
- Traverse7  $19-5=14$
- Traverse8  $14-5=9$
- Traverse9  $9-5=\text{PegL4}$

The first intersection occurs on the first return leg (Traverse 5). Details are given below the intersection and its small calculation gives a height of two and a half and hence, by convention, it is a  $\ast/\ast$  ie a cross over. The second intersection is again on Traverse 5 near the top of the jig and its calculation shows that it is at peg level 5 and is a  $\ast/\ast$  ie a tuck. The third intersection is on Traverse 6. and its calculation gives a peg height of two and half as for the first intersection. Subsequent intersections on this right to left leg all follow the same symmetrical pattern, of occurring at either peg level five or two and half and being respectively over or under, so in

practice only two quick calculations need to be made before the pattern becomes apparent.

Looping around Peg L4 the aiming peg, for the second left to right leg, is  $4 + 19 = 23$  and the successive aiming points are:-

Traverse10  $4+19=23$

Traverse11  $23-5=18$

Traverse12  $18-5=13$

Traverse13  $13-5=8$

Traverse14  $8-5=\text{PegR3}$

Similar diagrams to the previous ones could be produced to determine the intersection types on these traverses but it is quicker merely to note that the cord in starting from Peg L4 is three Bights away from the cord starting from L1. Where any cord is two bights away from a parallel cord then it will identically tuck or cross over a third intersecting cord. Where it is an odd number of Bights away then the reverse is the case. Observance of this rule makes the determination of all subsequent intersections a simple routine.

## PART 4-ESTIMATING KNOT LENGTH

Turksheads are absolutely unforgiving about the correctness of tucks and crossing but they are reasonably tolerant about their physical dimensions. Each Turkshead (TH) has its own basic shape dependant on Bights, Leads, Timings and cord width but we can, within limits, often squeeze or stretch it to fit our particular intended use.

Where a really wide TH has to fit accurately between fixed limits it is necessary to be able to estimate the length of the proposed knot and simple maths is there to help. The following method permits the length of a proposed knot to be calculated. Adjustments can then be made to the design so the revised knot will fit accurately between those fixed limits.

a) Wrap ten turns of the cord round the object to be covered, using your normal, final working tension. Measure the width and divide by ten to give the stretched diameter (C) of a single cord.

b) Measure the diameter of the object, add four times the single

cord diameter (4xC) to obtain the outside diameter (D) of the TH. Multiply this figure by 22/7(pi) to obtain the average outer circumference of the knot.

c) Divide this circumference by the intended number of Bights to obtain the Bight height. (B)

d) Multiply the cord diameter (C) by the intended number of times the Lead is to be multiplied, to obtain the width (W) at right angles across a Lead.

e) Divide W by B and take the nearest value of R from Table 1. Multiply that value by R by B to obtain the width along the knot of a single compartment (part) of the TH.

f) The total length of the proposed TH is then  $(L/2 + .4) \times P$ .

Following these steps permits the appropriate number of Bights, Leads, Timings and cord size for the right length of Turkshead to be calculated at the start. Working in millimetres is easier than in Imperial units.

<b>W/B</b>	<b>R</b>
<b>.05</b>	<b>.049</b>
<b>.10</b>	<b>.099</b>
<b>.15</b>	<b>.163</b>
<b>.20</b>	<b>.203</b>
<b>.25</b>	<b>.259</b>
<b>.30</b>	<b>.315</b>
<b>.35</b>	<b>.373</b>
<b>.40</b>	<b>.435</b>
<b>.45</b>	<b>.503</b>
<b>.50</b>	<b>.577</b>
<b>.55</b>	<b>.659</b>
<b>.60</b>	<b>.751</b>
<b>.65</b>	<b>.854</b>
<b>.70</b>	<b>.979</b>
<b>.75</b>	<b>1.13</b>
<b>.80</b>	<b>1.33</b>
<b>.85</b>	<b>1.61</b>
<b>.90</b>	<b>2.07</b>
<b>.95</b>	<b>3.04</b>

**TABLE 1**



## PART 5-CORD LENGTH

It is possible to calculate mathematically the length of cord for a Turk'shead but it is better to do this practically once the characteristics of the knot have been determined. If the cord is then stretched out on its destination, from the left side of its origin, following the line of a Lead and making the correct number of turns before returning to the left side, then that is marginally less than the length of one cord in a Lead of the finished knot. Multiplying by the number of multiplications and the number of Leads gives the length of cord required but to this should be added at least thirty per cent to cover the slack necessary in making up the knot.

It is wise and economical not to cut off the calculated length of cord but rather to make a thumb knot at half distance. Secure this knot around Peg L1 at the start and weave half the knot leaving enough slack to insert the final Multiplications. The experience of constructing the first half will indicate if the estimate was reasonably accurate. This will give the

confidence to measure the second half, cut it and thread it through the TH, in the reverse direction following the established pattern, to achieve the required number Multiplications.

## PART 6-TWILL WEAVE

A 'twill' fabric is one where the weave produces a series of diagonal ridges. A similar effect can be achieved in THs by varying the normal 'under, over' sequence of intersections. The simplest form is 'over two, under two' but there is no limit to the number of possible variations.

The basic method of producing twill THs remains identical with that described for a conventional knot in Parts 1 and 5. Cord size, Bights, Leads and Multiplications are determined in precisely the same way. The travel of the working end across the knot is identically determined by the 'golden rule'. Only the intersection pattern varies.

Fig7 shows a 6B 13L double twill TH together with the position of the columns of intersections from both left and

right edges noted below. It will be seen that all those in a single vertical line are identically either tucks or cross-overs. The solution to its construction is therefore finding a method of determining in which column an intersection is situated. Fortunately an intersection diagram of the type already seen in Fig 4 provides the answer, for if the values (at the side) for the heights of the originating pegs of the two cords are subtracted, the difference is the distance of the column from that side. The choice of side for the calculation is entirely a matter of convenience.

Fig7. It is helpful, before starting, to make a list on the lines of Table 2 so that the type of intersection is immediately apparent from the column distance from either the left or right side.

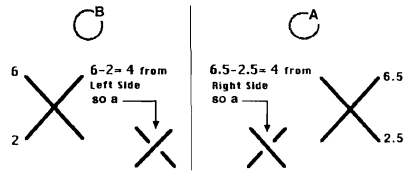


Fig. 8

LEFT SIDE Difference in Peg value	INTERSECTION TYPE	RIGHT SIDE Difference in Peg value
1 2		
3 4		1 2
5 6		3 4
7 8		5 6
9 10		7 8
11 12		9 10
		11 12

TABLE 2

Twills need not be limited to two crossings, neither need the number of crossings be the same along the length of TH. For stability it is desirable for the 'ridge' at the edges to be limited to two spaces or preferably one. Longer ridges at the edges can cause difficulty until a knot is fully tightened. Normally it is better for a knot

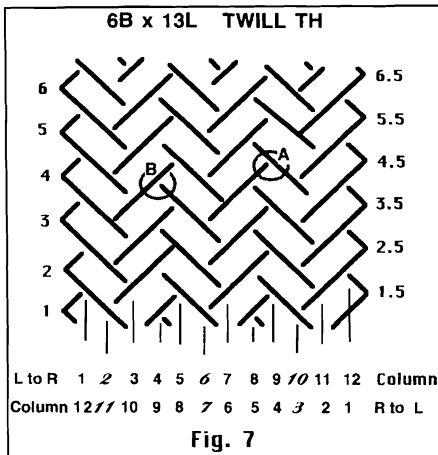


Fig. 7

Fig8 shows the intersection diagrams for the two ringed intersections of the twill TH of

to be symmetrical but there could be circumstances where asymmetry would be appropriate. Symmetry can only be achieved with an odd number of Leads.

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‘KNOTS AND SPLICES’  
A CAUTIONARY TALE

by Tim Field - Yorkshire -  
England

This is a brief communication to notify you of a situation in which the IGKT is named.

Eleven years ago, in the Spring of 1985, I was instrumental in having this knot book (written by Jeff Toghill) removed from the shelves of the Scout Shops Ltd. I was alarmed at the errors in the book and concerned that it was being sold in the Scout Shops. It was my opinion that accidents and serious injury might be caused if Scouts were to try to learn their knots from this book.

The book (originally published in Australia) is published in the UK by Fernhurst Books. Understandably, the UK publisher was unhappy and the publisher's representative, Tim J Davison (Partner), required

evidence of my claims. Geoffrey Budworth (Past President and then IGKT Secretary and Editor) prepared a review which substantially supported my opinion. Eric Franklin (Past President of the IGKT) did the same independently. Percy Blandford (then IGKT President) wrote a letter of support and so did Frank Harris (then IGKT Membership Secretary).

Geoffrey Budworth's review was sent to Fernhurst Books and it was accepted as 'most useful'. Mr Davison agreed to pass the review to the Australian publisher who would incorporate corrections before reprinting. The review recommended a distinguished Australian member of the IGKT, Charles H S Thompson, to advise the Australian publisher.

Eric Franklin's review was sent to the General Editor of Scouting magazine (for the Scout Association) to support the decision that the book should not be stocked by Scout Shops LTD until a corrected revision became available.

Recently I discovered that the book was again on sale at Scout Shops Ltd (Leeds); it was in its original version, reprinted many times since 1985 without revision. At my request, the Manager of the Leeds branch, Richard Nicholson, froze his stock and then contacted Fernhurst Books. The publisher claims no knowledge of any problem.

I have been asked to substantiate my claims and so I have provided Richard Nicholson with my own comments and with copies of Geoffrey Budworth's and Eric Franklin's 1985 reviews. I have also provided details of the earlier correspondence which involved ARA Scopes (then buyer for Scout Shops Ltd), David Easton (then General Editor of Scouting magazine), Tim J Davison (the publisher's representative and a partner in Fernhurst Books) and the distinguished members of the IGKT.

I will keep you informed of developments.

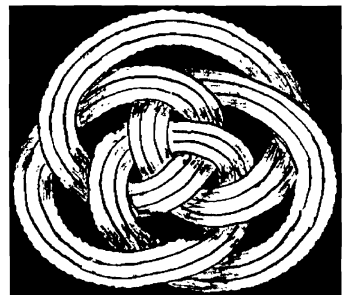
*Ed: You surely cannot get better 'experts' than those listed above, if they say the knots are*

*not correct presumably they are not.*

## **A letter from Brian Jarrett - Kent, England**

I thought you might be interested in the following, that is if it has not already been brought to the notice of the Guild in the past.

As many members know I make vast quantities of knot displays and I am always on the lookout for knots and plaits which can be displayed flat. Toying with a piece of cord the other day I tied a 4 Lead 3 Bight Turkshead, removed it from the cylinder I was tying on at the first stage. Instead of tightening on the cylinder I flattened the formation and followed around in the normal manner. The net result was a rather nice button knot. If it is tightened further it takes on another form with the centre lifting up to give a rather pleasant 3D effect.



flattened version of figure 30 as shown.

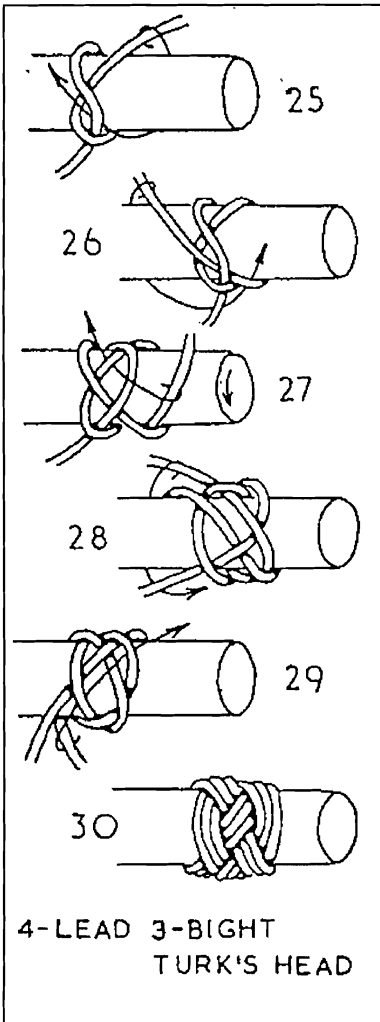
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### A letter from Geoff Youngman - Norfolk - England

Ref KM52, M McParlan's article on Macramé.

Early last year (1995) our local Rector, knew that I made knot boards and asked me if I would make one for the church to hang by the statue of St Nicholas. I thought a cross would have been right and appropriate on the board, if I could make one. After a lot of thought and not having seen one done, I came up with the one on the photo shown. The cross was made in 2mm cotton line with four Chinese Button knots, and the flat Portuguese Sennits in glazed string, (Portuguese Sennits as we called them at sea). In the centre I put another Chinese Button made in string to fill a little gap.

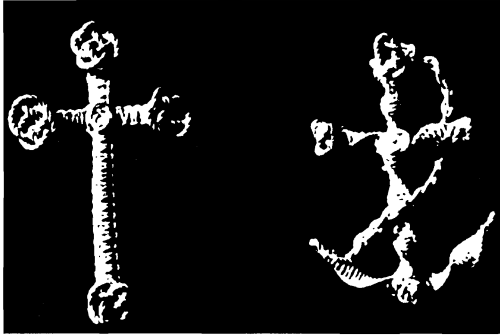
The Rector was most impressed, I don't think there are many churches with a knot board hanging in them. Having done the cross, I then tried the anchor using the same principal



4 Lead 3 Bight Turks Head tied flat. Tied in the normal way up to stage 29 then remove from the cylinder and flatten. Continue following around in the normal manner for about 3 tucks. You will then have a

and round Portuguese Sennit, what I came up with is also in the picture.

I hope this will be of interest to some knot tyers.



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**From Mike Wilson -  
Alexandria - VA**

Ref KM51, Mr Frans Masurel's article, on 4 Stranded Turksheads was appreciated greatly. It is the basis of completed projects and planned projects of mine. I hope a discussion of the 5 lead Turkshead knot will be published soon. Specifically, the uncommon Turksheads of 5 Leads 6 and 8 Bights. Also, these knots are excellent candidates to appear on IGKT Knot Charts.

**WEST COUNTRY  
KNOTTERS' NEWS**

from David Pusill- Somerset -  
England

The West Country Knotters are a small band of pilgrims with a strength of some eighteen members. Our area comprises of a radius of about forty miles around Bristol.

The weekend of the Bristol Festival of the Sea seemed to be a huge success, and several of our members spent the full four days with a display of knotting to advertise the Guild and our local branch.

While the Festival of the Sea was taking place another group from the Branch were nearby at the Woodhouse Park Scout & Guide Jamboree in Almondsbury. This group were showing the flag for the Guild while at the same time trying to help youngsters overcome their problems with some of their knots. What was surprising however, was the interest shown by the adult population. Guiders were coming up and asking how to tie all sorts of knots, some of which we rarely

decorative side of ropework nowadays and it's a refreshing change to be asked how to tie a Cow Hitch, albeit a Pedigree one.

Our display seemed to draw quite a lot of general interest in the Guild too, and most of our leaflets disappeared. However, we must wait and see if our labours have borne fruit, the next few weeks will tell us no doubt.

It was not surprising to find that many people did not even know that the IGKT existed. As many members know, this topic was brought up at the Guild's AGM at Gilwell Park earlier this year.

There was a very interesting demonstration of rope making by Terry Grimmer. The fascinating twist, pun intended, was that the rope was made out of toilet paper! Apparently the strength of this 'rope' was phenomenal. I was told on good authority, by the maker, that his rope had been known to be used as a tow rope for a bus no less. It was certainly a good advert for the loo paper manufacturer concerned.

The people who attended the Festival of the Sea seemed to have enjoyed themselves as well.

After setting up on Thursday everyone had an early night ready for the rigours of the show, staying at Richard's (Hopkins) house, just outside Bristol.

The official opening time 1000hrs was but all were in place and doing the final tidying up at 0900hrs. From then on it was BUSY! As Richard said (many times), he did not stop talking to the public for at least ten hours in the day. This also explains why his coffee was always cold, but not where the lunchtime rolls disappeared.

During the course of the show we managed to get inside the tent in which we were housed for brief intervals to see the rest of the Festival. Richard escaped for three spots of about one hour but does not know how everyone else managed because we were too busy to notice what the others were doing.

By the end of the Festival over 350,000 visitor had attended, about 600 ships and boats, and

an amazing range of trade stands and charity stalls. We were in a quiet area unfortunately situated behind a row of toilets, so did not get the full flow of visitors, but this was a relief (no pun intended). Had there been more customers asking questions we could not have coped, with only four members on the stand. If the Guild had a complete stand of its own we would have required about ten fit members to cope with the rush of questions that would have been generated by a larger and more varied display. We hope members will realise that volunteering for these sort of events is not a means of getting free entry to a 'jolly', nor is it a continuation of a conversation at the AGM, or showing off ones own eccentricities, but hard work on behalf of the Guild to encourage new members and spread the work about knotting.

During the Festival we were visited by many members who had come from all over the country to see the show and made a special effort to hunt us out. It was good to see some familiar faces who would try

not to trip us up with silly comments but were able to join in and divert our customers.

These customers came from all over the world, places as far apart as St Petersburg and Tucson and most places in between, and ranged from 'too young yet to tie their show laces' to 'it is more discrete not to ask in case the effort in answering causes a collapse'.

Although there were other displays of knots and several knotboards for sale we appeared to be the stand offering free hands on instruction and guidance on both simple and practical knots and some more advanced work. This seemed to be appreciated by those to whom we talked.

The Six Knot Challenge again proved popular with more people ready to have a go against the clock. Here again you have to grab and create your audience as they walk past, you have to vary the instruction to suit the 'victim'.

The champion of this Festival did not turn up until the 1st day when he showed great determination and spent a long time practising in order to get



the best time in the show, of 20 seconds! Since Rory Carson is only sixteen, if we could keep him in training for a year or so, there is no knowing what he might achieve.

As usual at these sort of events we met some very nice people both on our stands and from the public and hope that we will have persuaded several of them to become new members.

From the point of view of the Guild we believe that the Festival of the Sea was a success and on a personal level it was great fun, although very tiring. Thank you Cory Towing, for use of the stand. We don't think we let you down! Finally, thanks to those who manned (all males) the stand and who contributed items for display. Let us get our breath back in time for the next one.

Richard was soon on his way again, this time to sunny Cornwall and the Maritime Festival in Penzance which took place on the weekend of the 4-7 July. Richard attended this Festival with the Six Knot Challenge. Also working for the Guild were members from

as far away as Northampton and Dunstable, together with other members of the Peninsular Branch. To cap it all there were even two members from New Zealand visiting. Over to Richard:-

Although we were all busy it was not quite as hectic as the Bristol show, (although, because I had been stuck outside the marquee I was not able to monitor their progress properly). If people keep their work we should get a lot of new recruits to the Guild as there was a lot of interest in all aspects of our display.

As often happens, the Six Knot Challenge generated some healthy competition. At close of play on Saturday the time was down to 20 seconds. First thing on Sunday morning one lad came and managed 19 seconds then had to leave before the basin was closed. Shortly thereafter, the 20 second competitor returned and tried again but was all thumbs. He returned as we were packing up and in the last run of the clock managed seventeen point five seconds. This was all the more remarkable because he had only

just returned to work after losing his right index finger in an accident. When fumbling he was trying to use the missing finger to push ends through.

Accommodation for some of us was in the local Sea Cadet unit and on the Friday evening after the show finished we gave some instruction to the Cadets in knot tying, (with varying degrees of success).

Sadly we were unable to follow up the many invitations to visit vessels as there were not enough hours in the day. All in all it was a very pleasant and successful few days which was enjoyed by those participating and should be of benefit to the Guild.

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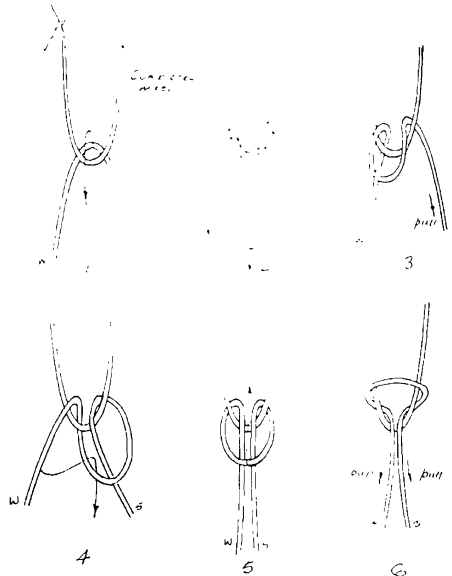
**NET MAKING  
USING A  
CONTINUOUS CORD  
AND SQUARE KNOTS**

From Gordon Court - Somerset  
- England

At the Portsmouth Dockyard nets are made by a curious method which does not involve, at any stage, the working end being passed through an already

completed mesh. Indeed the end cannot be so passed as it is a large ball of cordage usually contained in a bucket from which it is not removed. By this method there are no joints in the net.

Des Pawson asked me both at Weston last year and at the Bristol Festival of the Sea to write this method.



The working end 'w' is a ball of cordage too large to be passed through an already completed mesh.

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