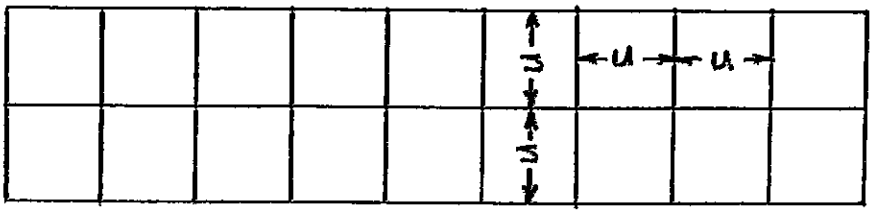
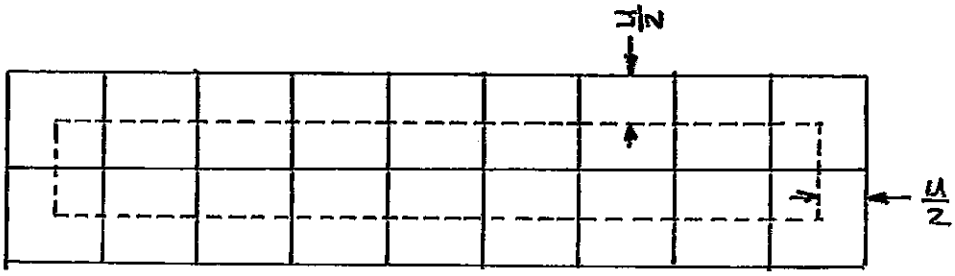
CELTIC KNOTWORK

IAN BAIN'S METHOD

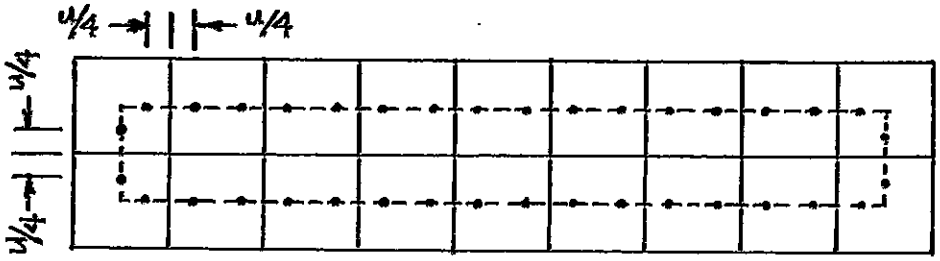
THE BASIC METHOD



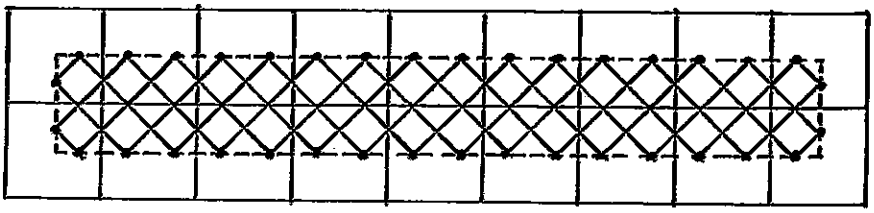
STEP 1 : DRAW THE GRID. "U" EXPRESSES ITS UNIT MEASUREMENT.



STEP 2: MARK OFF A MARGIN WHICH HAS A WIDTH OF U/2 ALL AROUND THE PATTERN.

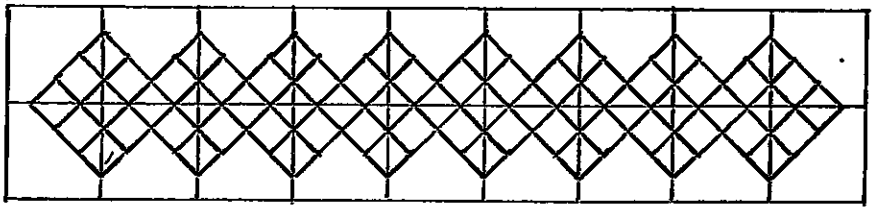


STEP 3 : MARK THE QUARTER POINTS, U/4, ALL AROUND THE INSIDE OF THE MARGIN.

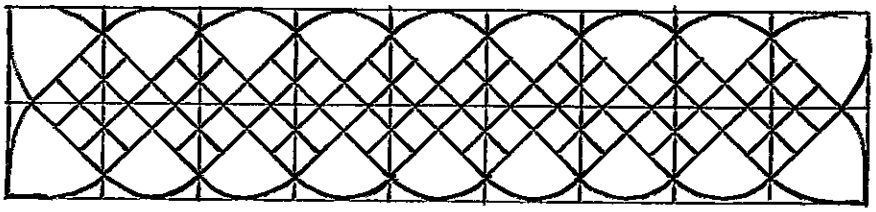


STEP 4 : DRAW THE DIAGONALS

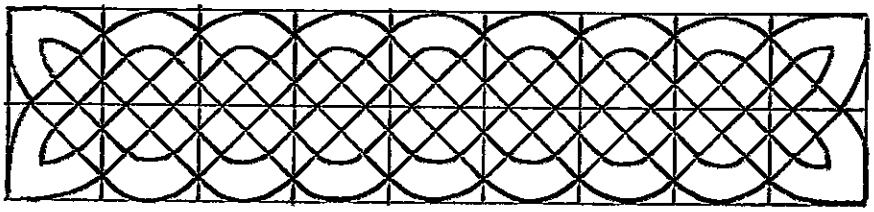
CELTIC KNOTWORK
IAN BAIN'S METHOD



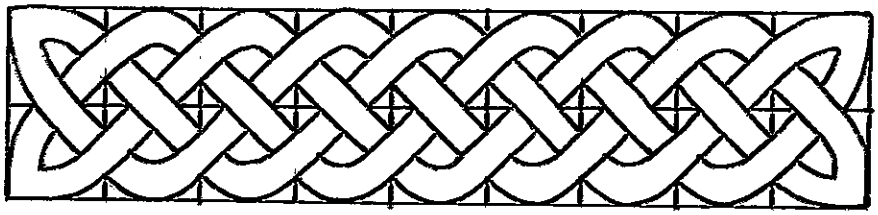
STEP 5: EXTEND THOSE DIAGONALS WHICH WILL MEET AT THE GRID LINES.



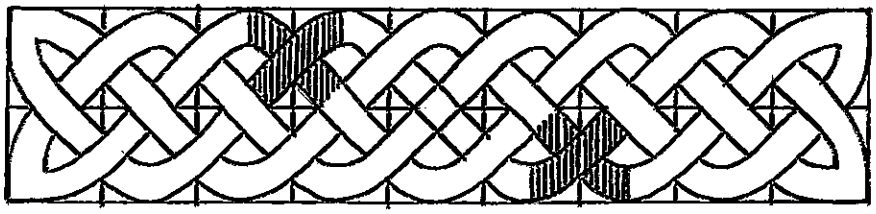
STEP 6: DRAW THE OUTER CURVES OF THE CORDS, MERGING THOSE AT THE ENDS INTO THE BORDERS. AVOID KINKS OR REVERSE CURVES.



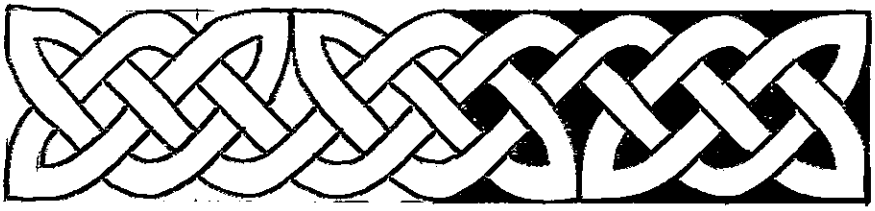
STEP 7: DRAW THE INNER CURVES MAINTAINING CORD THICKNESS. COMPLETE THE CORNERS WITH SHORT STRAIGHT LINES.



STEP 8: ERASE LINES TO FORM A PLAIT. AN "UNDER" IS ALWAYS FOLLOWED BY AN "OVER".

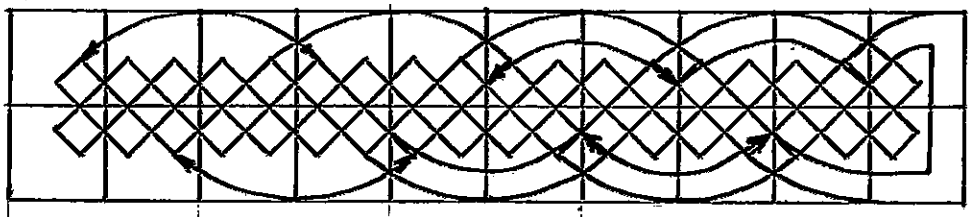


STEP 9 : ERASE THE HATCHED PORTIONS OF THE PLAIT



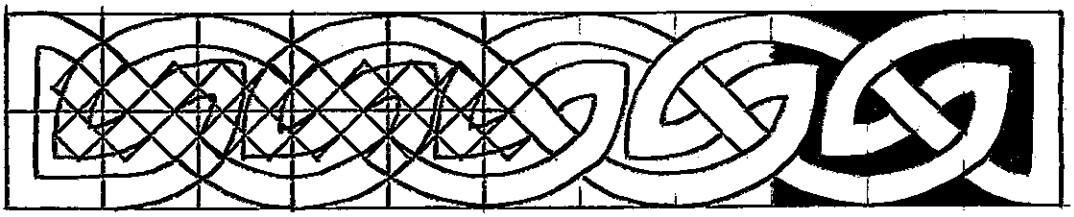
STEP 10 : FORM THE RETURNS USING THE SAME TREATMENT SHOWN FOR THE CORNERS IN STEPS 6 & 7. AGAIN - DRAW THE OUTER CURVES FIRST AND THEN THE INNER CURVES MAINTAINING CORD THICKNESS.

THE ABOVE PATTERN USES THE "SHORT" CURVE. THE FOLLOWING PATTERN USES THE "LONG" CURVE. TO DEVELOP THE PATTERN FOLLOW STEPS 1-4 OUTLINED ABOVE.



STEP 5 : DRAW THE SWEEPING "LONG" CURVES, THE OUTER LINES FIRST, FOLLOWED BY THE INNER LINES, MAINTAINING CONSTANT CORD THICKNESS. THE ARROW POINTS ↘ MARK THE POINTS WHERE THE OUTER AND INNER CURVES SPRING FROM.

STEP 6 : DRAW THE END TREATMENT - STRAIGHT LINES LEADING ROUND FROM HALF A "LONG" CURVE ON ONE SIDE TO HALF A "SHORT" CURVE ON THE OTHER SIDE.



STEP 7 : DRAW THE CORDS AROUND THE MIDDLE AXIS WITH SHORT CURVES AND STRAIGHT LINES, OUTER LINES FIRST, THE INNER LINES MAINTAINING CONSTANT CORD THICKNESS

STEP 8 : ERASE THE UNWANTED LINES TO REMOVE THE GRID AND FORM THE WEAVING (AN UNDER IS ALWAYS FOLLOWED BY AN OVER). FILL IN THE DARK BACK-GROUND IF DESIRED.

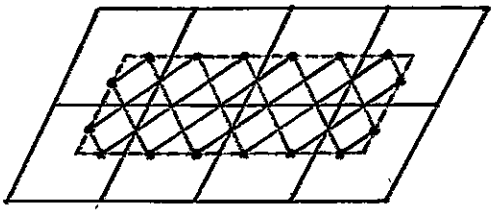
GRID CELL SHAPES

THE CREATION OF THE KNOTWORK PATTERNS, AND THEIR INCLUSION IN PANELS OF DIVERSE SHAPES AND SIZES, IS REALLY VERY SIMPLE, ONCE THE "LANGUAGE" IS UNDERSTOOD AND THE STEP BY STEP BUILD UP OF THE SETTING OUT IS MASTERED. ALMOST ANY PANEL SHAPE CAN ACCOMODATE CELTIC KNOTWORK IF IT CAN BE DIVIDED INTO A WHOLE NUMBER OF GRID-UNITS. THE SHAPE OF THE PANEL AFFECTS THE SHAPE OF THE GRID-UNIT.

THE MOST COMMON GRID SHAPE IS THE SQUARE, USED IN A SQUARE OR OTHER RECTANGULAR PANEL, OR IN THE RECTILINEAR PARTS OF MORE COMPLICATED PANEL SHAPES. HOWEVER, NOT EVERY GRID UNIT HAS TO BE A SQUARE OR EVEN THE SAME SIZE. IF THE GRID UNITS ARE NOT SQUARE, THEIR LENGTH EXCEEDS THEIR BREADTH BUT THE RATIO SELDOM EXCEEDS 4:3. IRREGULARLY SHAPED GRID-UNITS WHICH ALWAYS HAVE FOUR SIDES, SEEM ALSO TO HAVE BEEN DRAWN WITH THESE PROPORTIONS IN MIND.

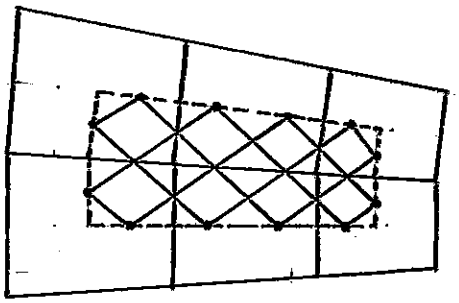
CELLS WITHIN A GRID WHICH IS NOT SQUARE : THE MARGIN IN THE EXTERIOR CELLS IS STILL 1/2 WIDE AND THE DIAGONALS STILL MEET THE QUARTER POINTS MARKED AROUND THE MARGIN AS IN THE BASIC METHOD SHOWN PREVIOUSLY.

RHOMBOID GRID-UNITS



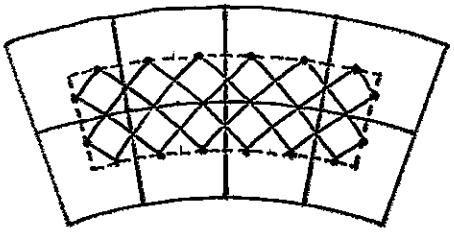
THE CORDS WILL BE DIFFERENT THICKNESS DEPENDING ON THE DIRECTION OF THE DIAGONAL

TRAPEZOID GRID-UNITS



THE CORDS ARE TAPERED AND CONTINUE TO GET SMALLER AS THE GRID UNITS REDUCE IN SIZE.

ANNULAR (RING-SHAPED) GRID-UNITS



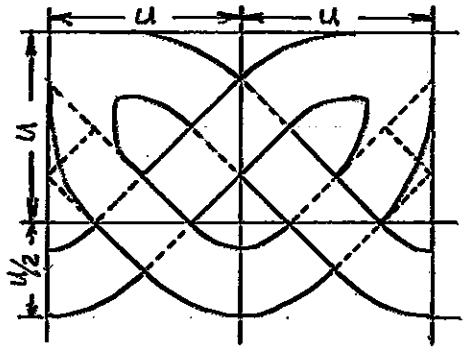
THE CORDS ARE CURVED AS WELL AS TAPERED.

IN SQUARE GRID-UNITS, THE THICKNESS OF THE CORD WILL BE ONE THIRD THE SIZE OF THE UNIT (U/3 - SEE STEP 1). WITH GRID-UNITS OF OTHER SHAPES, THE THICKNESS OF THE CORD WILL VARY AS DESCRIBED ABOVE. THESE VARIATIONS IN CORD THICKNESS CAN BE LEFT AS THEY OCCUR, OR, IN THE COMPLETION OF THE KNOTWORK, THE CORD THICKNESS CAN BE ADJUSTED TO BE UNIFORM. ADJUSTING THE CORD THICKNESS WILL EITHER INCREASE OR DECREASE THE SPACES BETWEEN THE CORDS. WHEN FINISHING A KNOTWORK DESIGN, THE CORD THICKNESS MAY BE MADE LARGER OR SMALLER TO CREATE THE DESIRED DESIGN EFFECT

STANDARD (HISTORICAL) KNOT SHAPES.

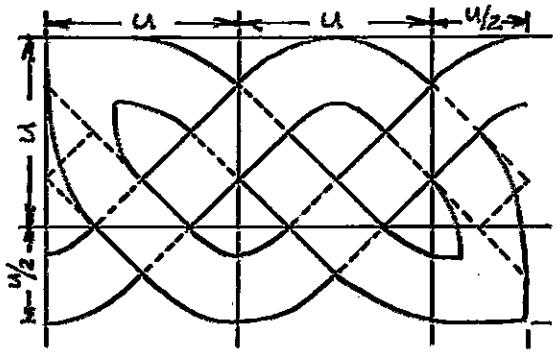
THE FOLLOWING 8 KNOT SHAPES WERE IDENTIFIED BY HISTORIAN ROMILLY ALLEN FROM HIS RESEARCH OF MANUSCRIPTS AND MONUMENTS. THE KNOT NUMBERS HAVE NO SIGNIFICANCE.

KNOT 1



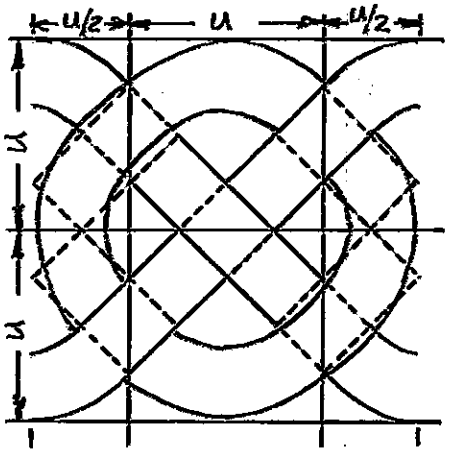
THIS KNOTWORK PATTERN IS REPEATED EVERY 2 GRID-UNITS

KNOT 2



IF CONTINUED, THE KNOTWORK IN THE NEXT 2½ GRID-UNITS WOULD BE THE MIRROR IMAGE OF THIS PATTERN. SO THE ENTIRE KNOTWORK PATTERN REPEATS ITSELF EVERY 5 GRID-UNITS.

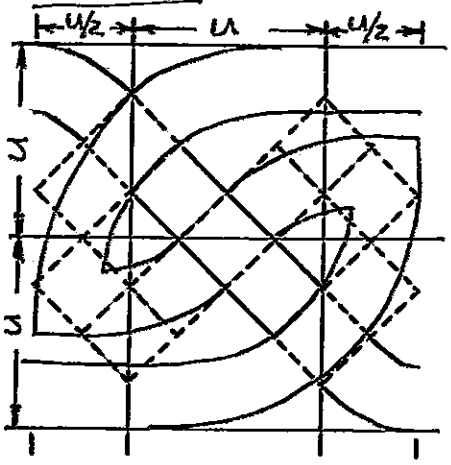
KNOT 3



THIS KNOTWORK PATTERN IS REPEATED EVERY 2 GRID UNITS.

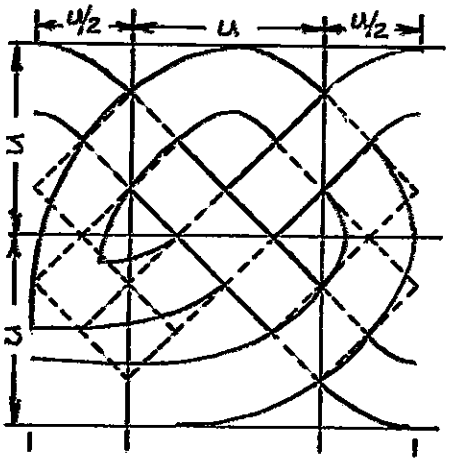
CELTIC KNOTWORK
IAN BAIN'S METHOD

KNOT 4



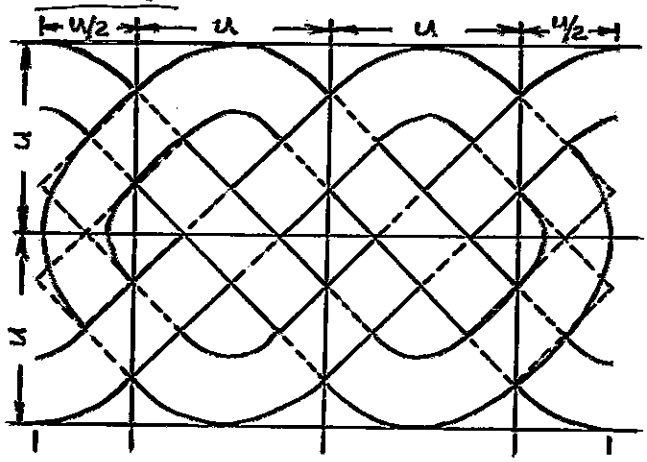
THIS KNOTWORK PATTERN IS REPEATED EVERY 2 GRID-UNITS. SOME OF THESE KNOTS CAN BE DRAWN WITH DIFFERENT ASPECTS, THE MOST VERSATILE BEING KNOT 4 WHICH CAN BE MIRRORED BOTH VERTICALLY AND HORIZONTALLY.

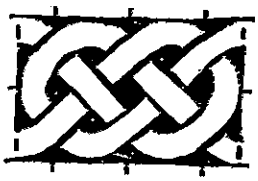
KNOT 5



THIS KNOTWORK PATTERN IS REPEATED EVERY 2 GRID-UNITS.

KNOT 6

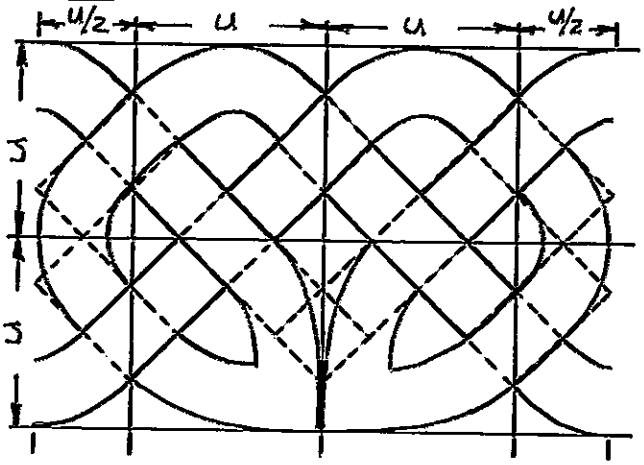




THIS KNOTWORK PATTERN IS REPEATED EVERY 3 GRID UNITS.

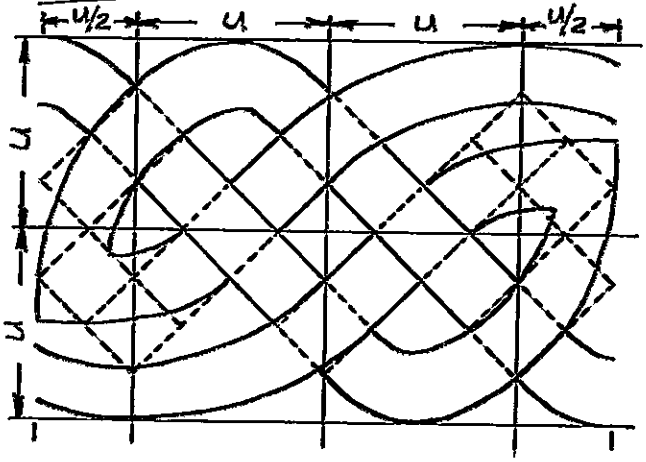
CELTIC KNOTWORK
IAN BAIN'S METHOD

KNOT 7



THIS KNOTWORK PATTERN IS REPEATED EVERY 3 GRID UNITS.

KNOT 8

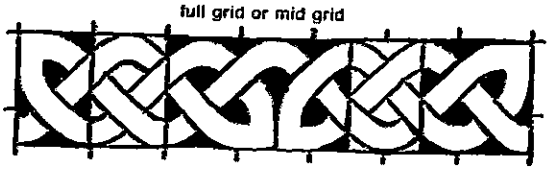


THIS KNOTWORK PATTERN IS REPEATED EVERY 3 GRID-UNITS.

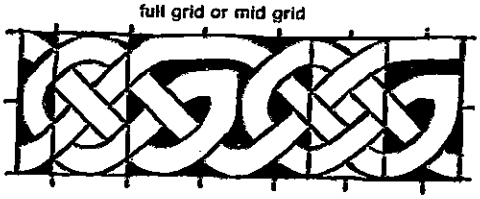
THE FOLLOWING SHOW HOW KNOTS CAN BE EXTENDED TO CREATE PATTERNS WITH MORE THAN THE MINIMUM REPEAT. THE EXTENSION IS ACHIEVED BY INTRODUCING ADDITIONAL SHORT CURVE (PLAIT) UNITS, EITHER AT FULL- OR MID-GRID POSITIONS.

KNOT 1

KNOT 2

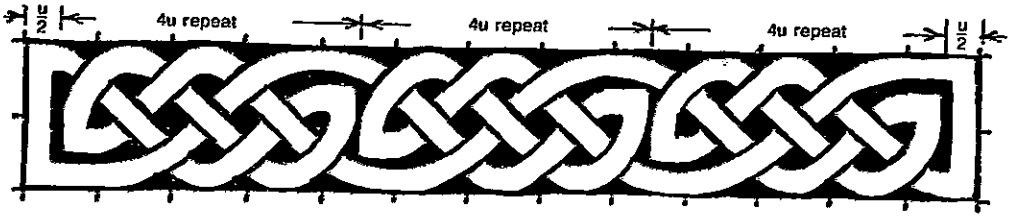


KNOT 4



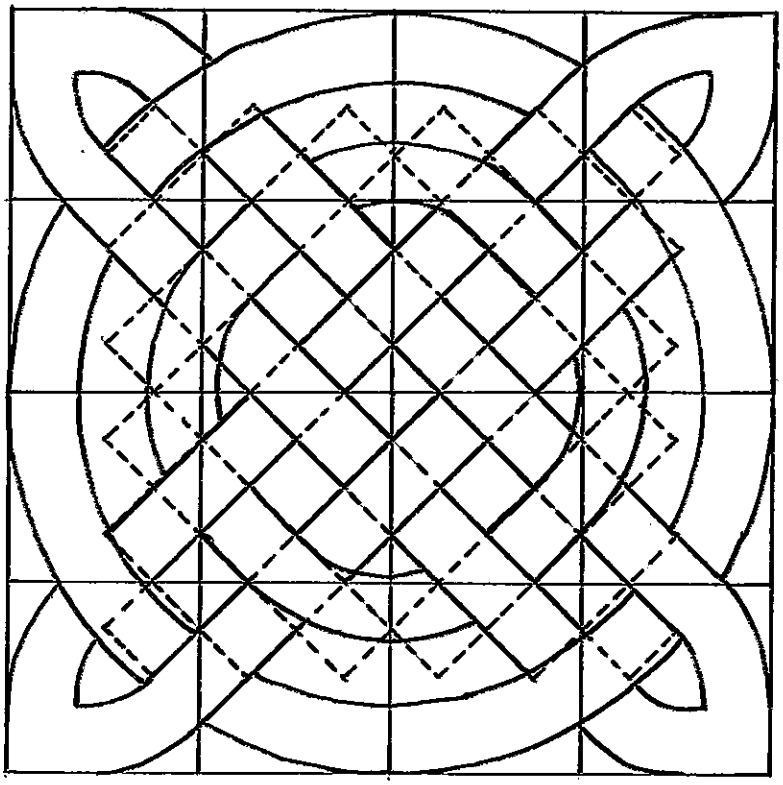
KNOT 7

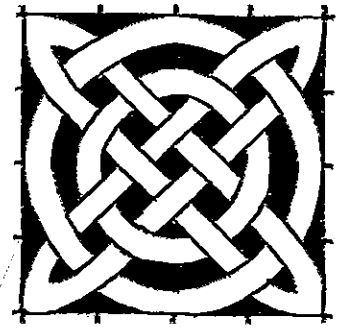
KNOT 8



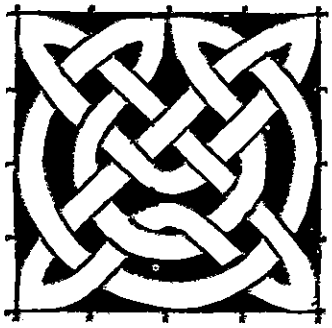
TWO OTHER KNOTS COULD BE ADDED TO ROMILLY ALLEN'S LIST OF EIGHT. ONE (KNOT 9) IS THE KNOT THAT WAS USED TO DEMONSTRATE THE BASIC METHOD ON PAGES 1-3 OF THIS HANDOUT. THE OTHER IS SHOWN BELOW

KNOT 10





MAKING TWO BREAKS IN THE ABOVE PATTERN CREATES A HORSESHOE PATTERN.

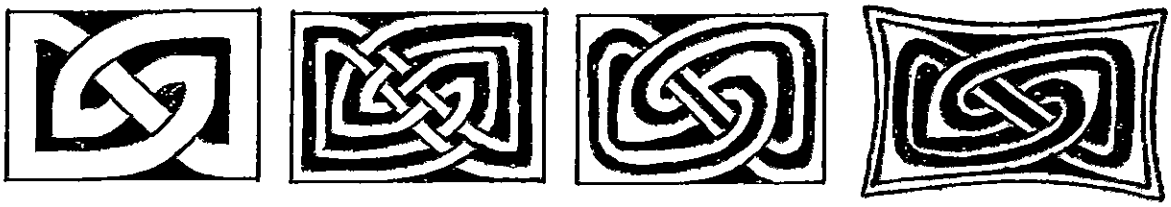


KNOTWORK CHARACTERISTICS

1- THE STRONG DIAGONALS
2- THE POINTED SPADE LOOK - CAUSED BY STRONG DIAGONALS & POINTED CORD RETURNS
3- THE CONSISTENCY OF THE INTERLACING - EACH "OVER" IS FOLLOWED BY AN "UNDER"
4- THE PATTERN REPEAT.
5- CONTINUITY OF PATH - THIS WAS SOUGHT BUT NOT INSISTED UPON. HOWEVER, RINGS, OR LINKED CORD RETURNS, WHETHER OR NOT THEY CROSS ONE OR MORE INTERLACING CORDS, SHOULD BE AVOIDED UNLESS THEY FORM AN INTEGRAL PART OF THE PATTERN (SEE KNOT 3 AND KNOT 10).
6- THE SPIRAL LOOK

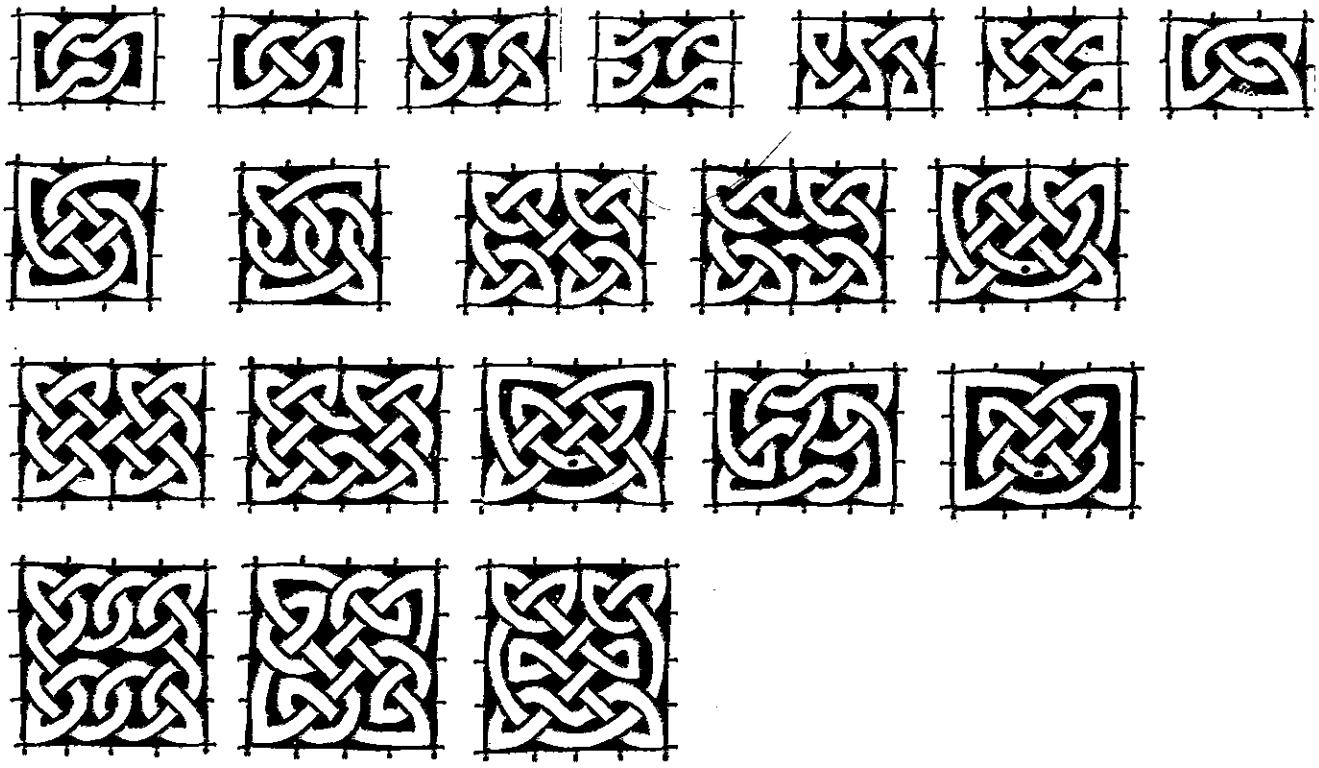
FINISHING KNOTWORK

DIFFERENT FINISHES CAN BE USED IN COMPLETING THE KNOTWORK PATTERN.

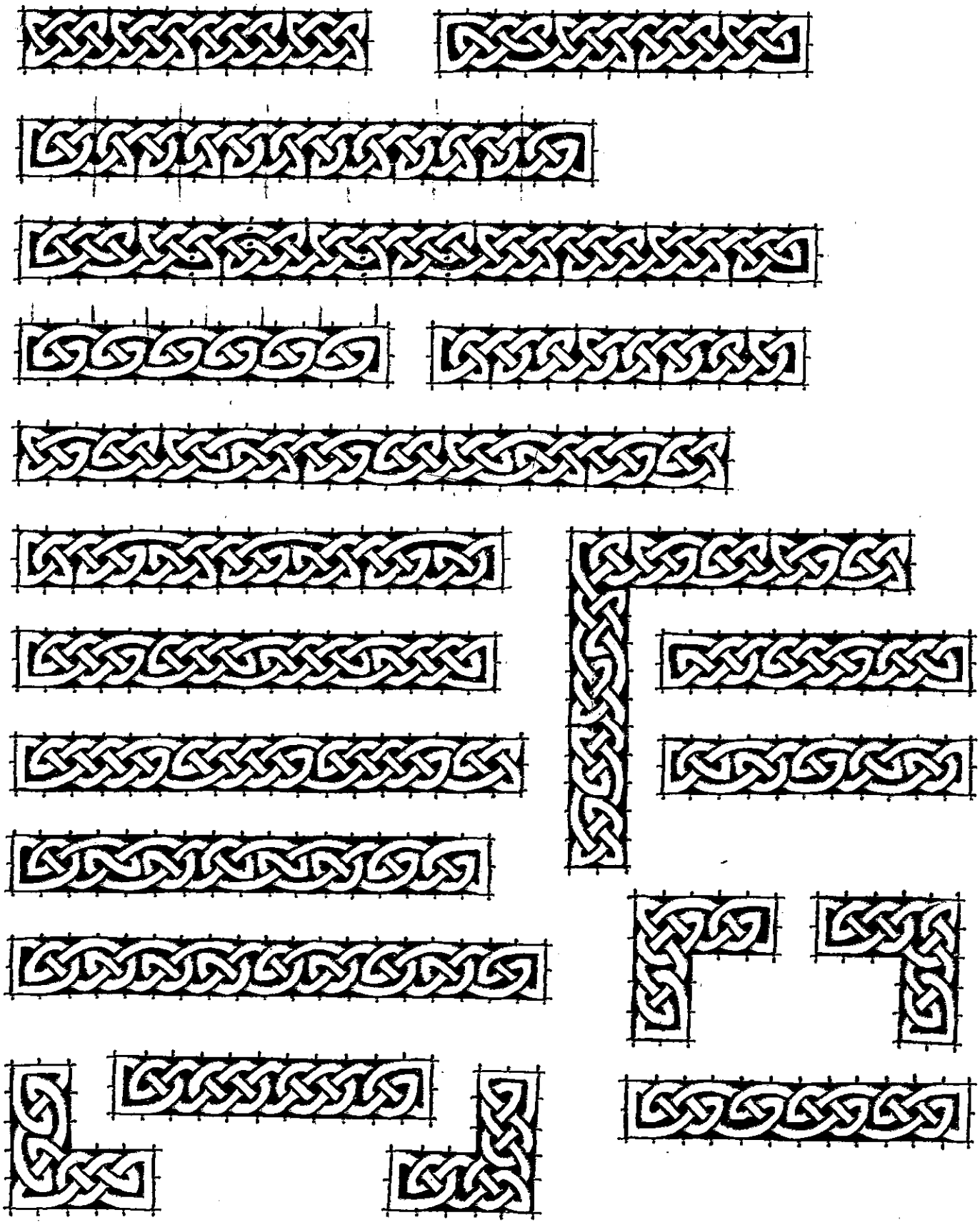


OTHER PATTERNS

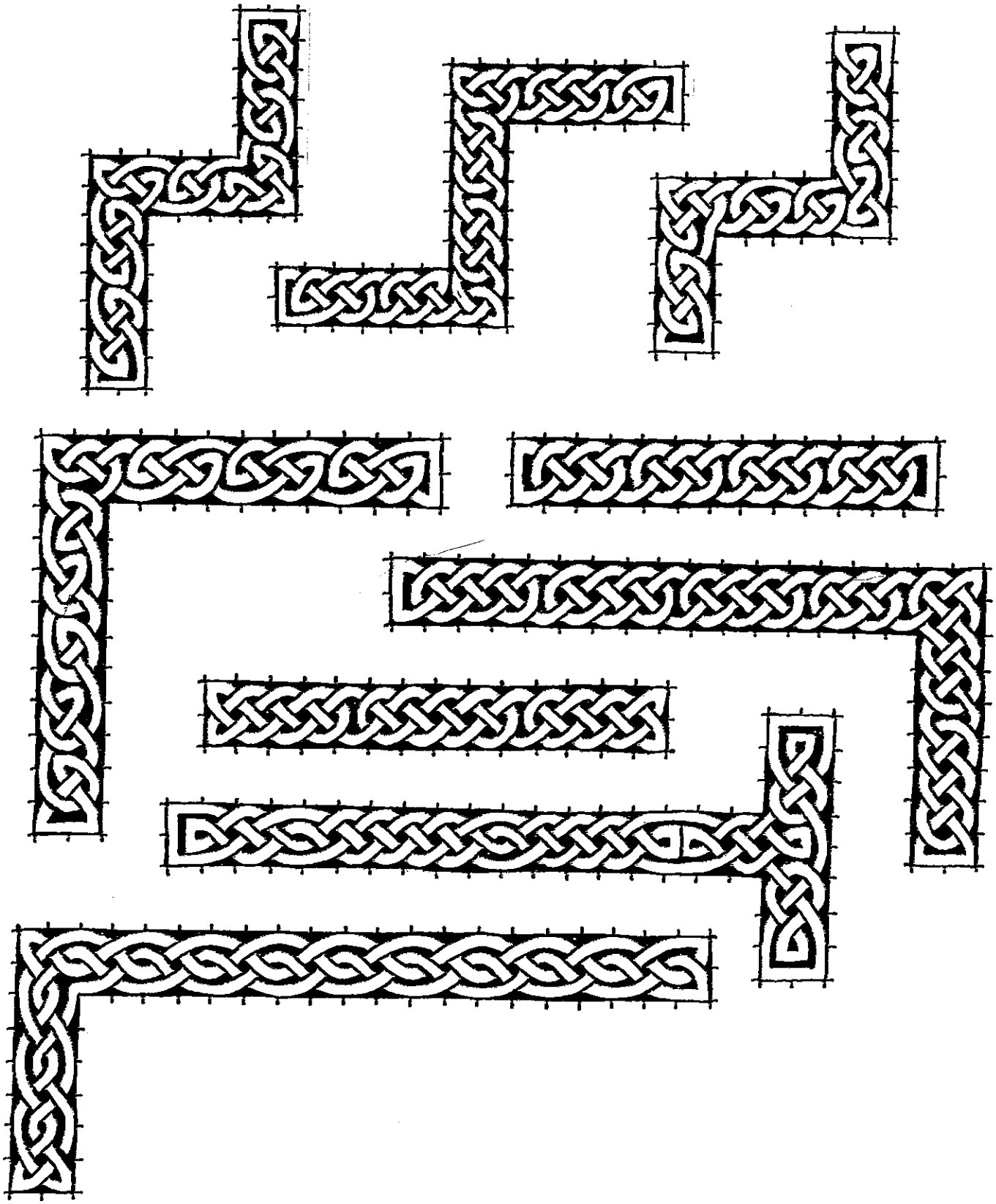
A GREAT MANY PATTERNS ARE POSSIBLE IN PANELS THAT ARE SMALL IN TERMS OF GRID-UNITS.



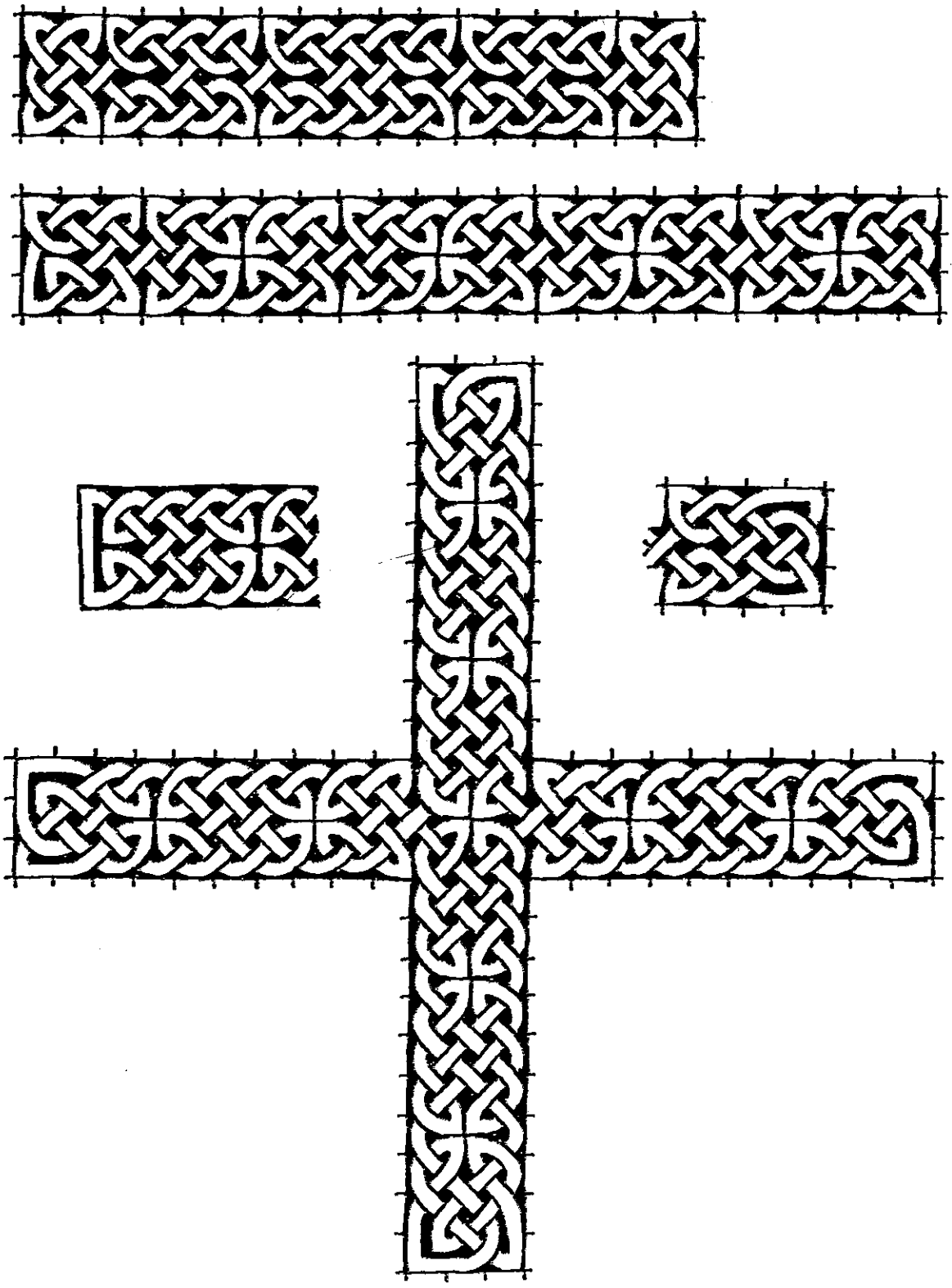
STANDARD PATTERN RECONSTRUCTIONS



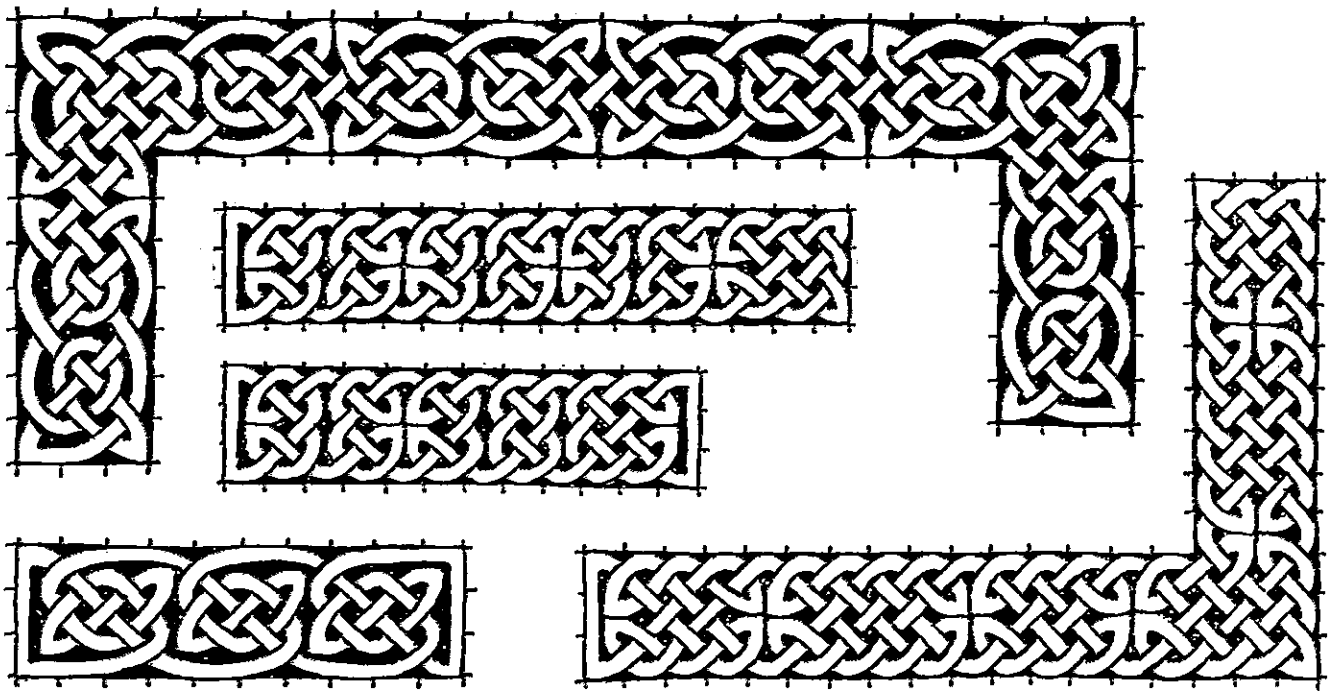
STANDARD PATTERN RECONSTRUCTIONS

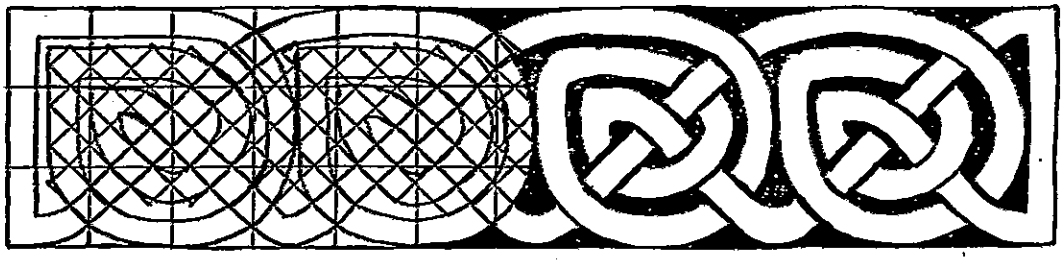


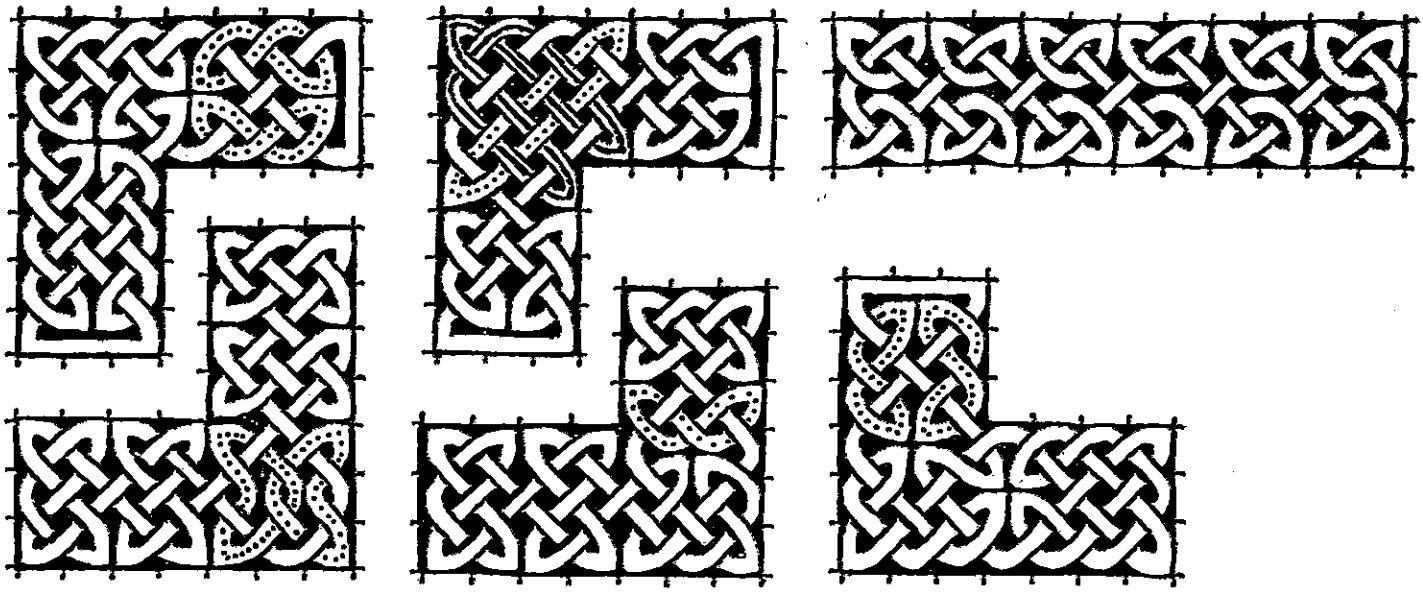
STANDARD KNOTWORK RECONSTRUCTIONS



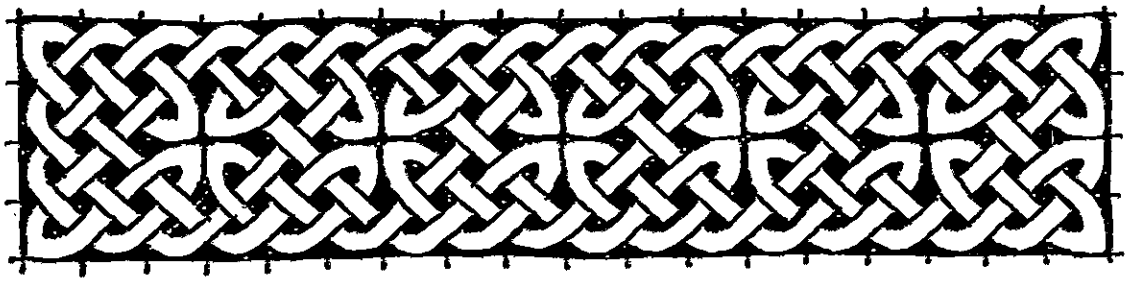
STANDARD KNOTWORK RECONSTRUCTIONS

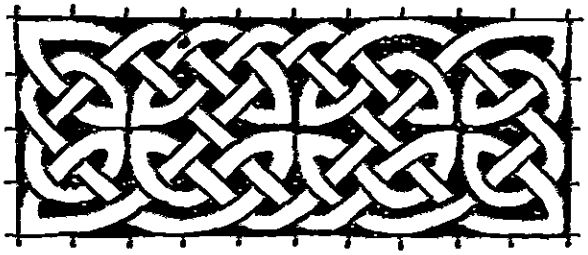


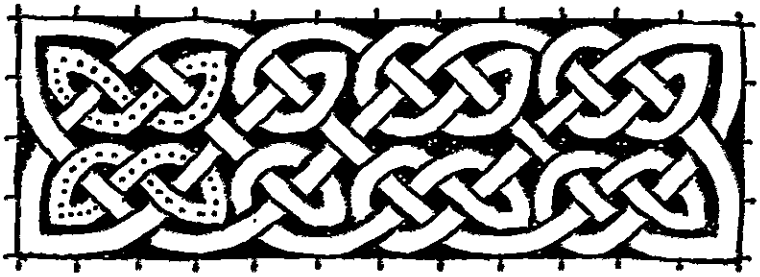


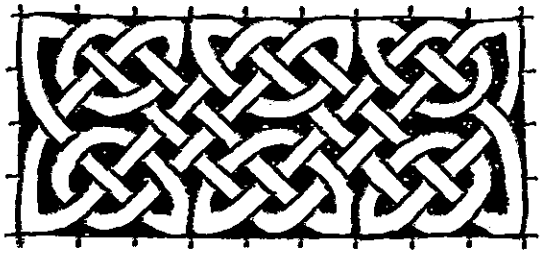


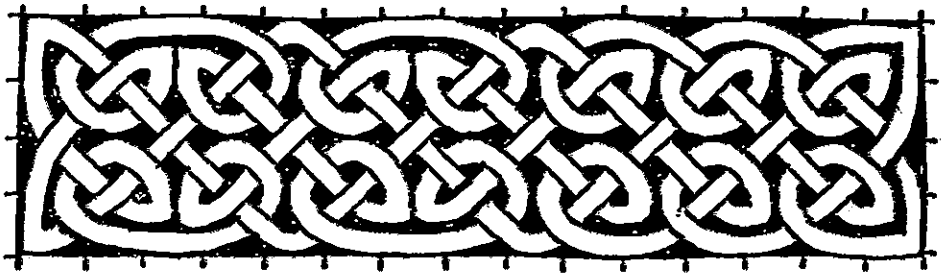
STANDARD KNOTWORK RECONSTRUCTIONS

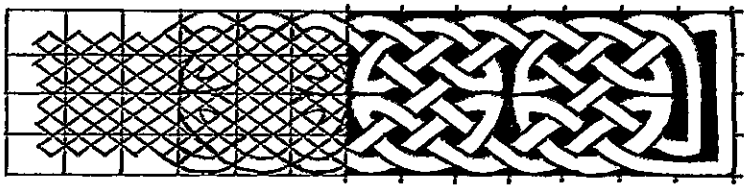


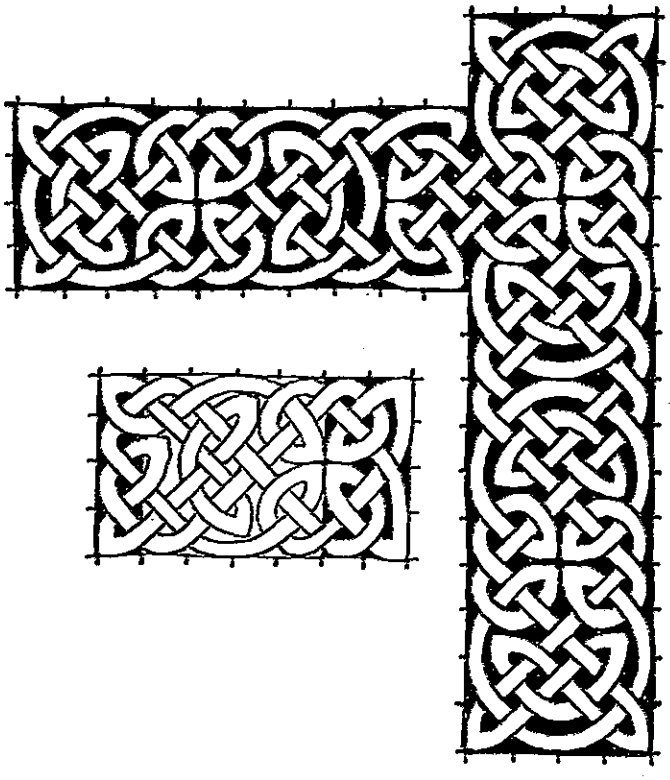


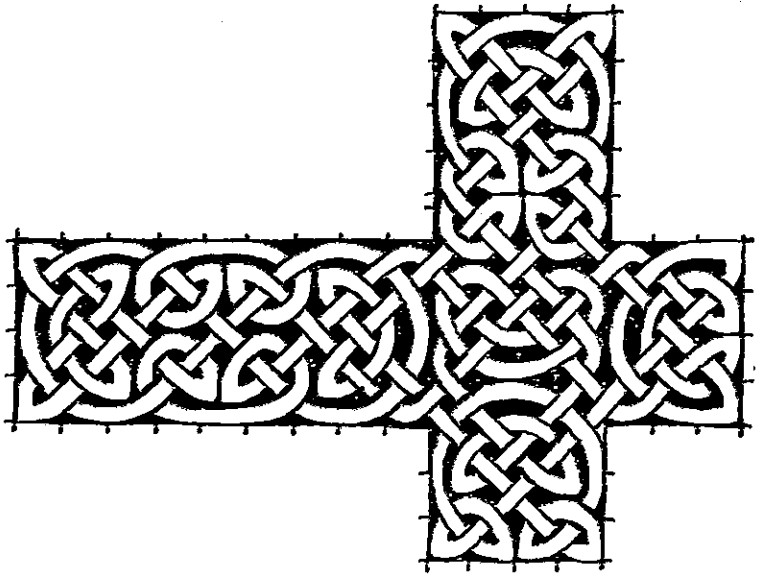




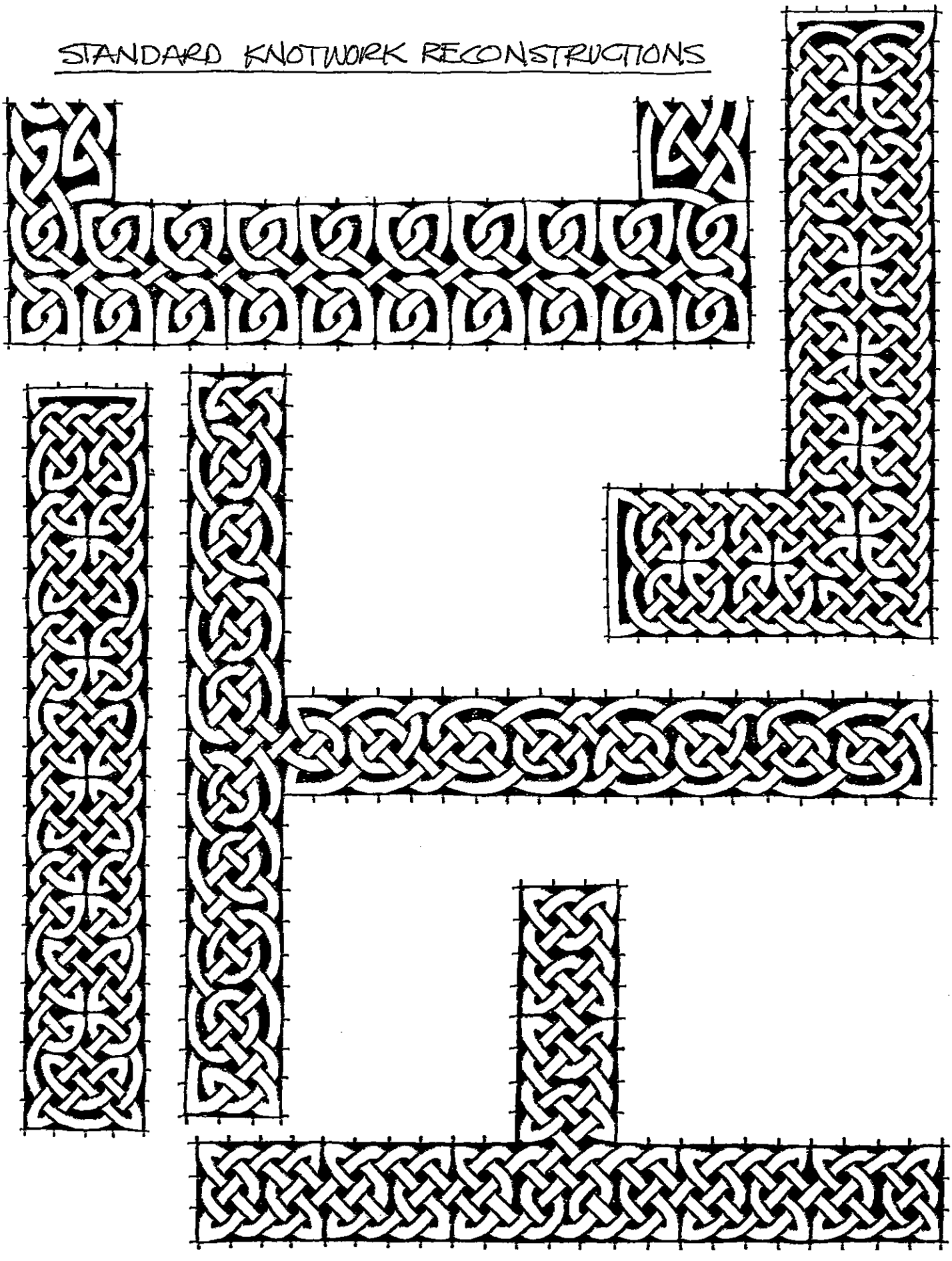








STANDARD KNOTWORK RECONSTRUCTIONS



CELTIC KNOT CLASS
Lee's method for filling a panel

Determine the approximate size, shape, location, and orientation of the panel to be filled with a celtic knot.

Select the knot, knot variation, or combination of knots that you want to use in the panel.

Determine the number of grid-units required (in both directions) for a complete repeat of the knot or knot combination.

Decide upon a tentative desired cord thickness and determine the resulting grid-unit dimension. The size of "u" (the dimension of a square grid-unit) will be approximately equal to three times "t" (the cord thickness).

Determine if the panel dimensions will accommodate the number of grid-units required in each direction to allow a complete number of repeats of the Celtic knot or combination selected?

If the fit is not exact (and it usually is not), the following questions may provide some help in making it fit.

- Can the panel shape or dimensions be adjusted?
- Can the grid-unit dimensions be adjusted?
- Does the shape of the grid-unit need to be modified from the standard square to fit the panel better?
- Would stretching the grid-unit into a rectangle (keeping the length to width ratio within the appropriate limits) help to fit the right number of grid-units into the panel?
- Would expanding the knot (see hand out from Ian Bains book) in one or more of the repeats or adding some other "filler knot work" help?
- Does the knot or knot combination need to be changed to change the number of grid-units required in each repeat?

Make final decisions about the Celtic knot or combination to be used, the size and shape of the panel, and the shape and size of the grid-units.

Draw the grid-unit lines on the panel

Draw the margin lightly through the outer-most grid-units around the edge of the panel.

Mark off the quarter points along the margin within each grid-unit around the edge of the panel

Follow Ian Bain's basic method for constructing the knotwork.

Make adjustments as necessary to complete and fill the panel with knotwork.

CELTIC KNOTWORK
BIBLIOGRAPHY
from information obtained from Drew Ivan's webpage

ONLINE RESOURCES

Drew Ivan's webpage http://www.craytech.com/drew/knotwork/knotwork.html
Instructions on creating Celtic knots

Christian Mercat's webpage (in English) http://www.abbott.demon.co.uk/mercatmethod.html
Instructions on creating Celtic knots

Marc Wallace's webpage http://www.wallace.net/knots/ step-by-step instructions for drawing Celtic knots - simplified for easier computer implementation

Steve Abbots webpage http://www.abbott.demon.co.uk/knots.html Provides at no cost a downloadable computer program for generating celtic knots which is based on the method described on Christian Mercat's webpage.

Courtney Davis webpage http://www.celtic-art.com/ Commercial site

Silver Harloe webpage http://www.silverchat.com/~silver/knotwork-cgi.html has a knotwork generator online. Just read the instructions and follow simple directions to create knotwork images.

BOOKS

Many of these books exist in many editions, and there may be other copyright dates for editions other than those listed.

Celtic Knotwork, by Iain Bain © 1986. Mr. Bain has produced the very best reference available to artists wishing to reproduce Celtic knotwork patterns. His father, George, wrote a book that describes construction techniques of many Celtic patterns, but it is very difficult to work from.

Celtic Key Patterns, by Iain Bain © 1993. In this book, Mr. Bain describes the construction of Key Patterns with the same clarity and simplicity that makes Celtic Knotwork so valuable.

Celtic Art: The Methods of Construction, by George Bain © 1973. The elder Bain shows how the Celts could have drawn their intricate patterns. He covers knotwork, spirals, key patterns, lettering, and zoomorphic designs. Though this book has a wider scope and many more examples than Iain's books, George's methods of construction are more difficult to follow.

Celtic Art in Pagan and Christian Times, by J. Romilly Allen © 1993. Both Bains rave about Allen's landmark works that describe the nature and significance of Celtic Art. This book is hard to find, but worth the effort. It shows some methods of construction, but everything is approached from the point of view of an art historian, not an artisan.

Knotwork: The Secret Method of the Scribes, by Aidain Meehan © 1991. Meehan's method is a little more difficult than Iain Bain's, but this book addresses a number of interesting issues related to knotwork.

How to Draw Celtic Knotwork: a Practical Handbook, by Andy Sloss © 1995. Mr. Sloss describes how to create knotwork patterns by beginning with a palette of small squares, each of which has a small piece of the overall pattern on it. This method is well-suited to computer-based work.

Celtic Knotwork Designs, by Sheila Sturrock © 1997. This book doesn't contain much in the way of methodology, but it does demonstrate how to construct many different knots. Examples include heart motifs and zoomorphic (animal) patterns, both of which are very popular.

The Celtic Art Source Book © 1988, Celtic Borders and Decoration © 1992, Celtic Mandalas © 1994, by Courtney Davis. Mr. Davis is a master of combining Celtic patterns with other imagery to produce evocative artwork. His illustrations grace many books on Celtic subjects and a Tarot Deck. His books are filled with great examples that inspire your own creativity and show that the knotwork, spirals, and key patterns invented by the Celts are still relevant today.

The Lindisfarne Gospels, by Janet Backhouse © 1981. The Lindisfarne Gospels are illuminated manuscripts produced by the monks at the monestary of Lindisfarne. The intricate artwork is distinctly Celtic, but the gospel texts are Christian. Ms. Backhouse does a good job of describing how these two cultures came together to produce the famous manuscript. The illustrations show the fine artwork that went into the Lindisfarne Gospels.

The Book of Kells, by Sir Edward Sullivan © 1986. Sir Sullivan treats the Book of Kells, another illuminated manuscript (produced by the monks at the monestary at Kells), with the same attention that Ms. Backhouse gives the Lindisfarne Gospels.