

## I.

## NOTES ON CELTIC ORNAMENT—THE KEY AND SPIRAL PATTERNS.

BY J. ROMILLY ALLEN, F.S.A. Scot.

The purely geometrical forms of ornament which occur upon Celtic works of art of the early Christian period may be divided into three classes, namely (1) interlaced-work, (2) key patterns, and (3) spiral patterns. The first of these has been dealt with in a previous communication;<sup>1</sup> and it is proposed in the present paper to treat of the two latter branches of the subject.

Celtic art of the Christian period, although it differs materially from that of pagan times, still retains many of the most marked characteristics of the older style, showing that there was no real break in the continuity of the art history of the country resulting from the introduction of the new religion. What is known of the forms of ornament that prevailed in Great Britain during pagan times is derived almost exclusively from the study of objects of bronze, such as shields, helmets, sword-sheaths, horse-trappings, mirrors, armlets, &c., found frequently in connection with sepulchral remains. These objects are either cast or wrought with the hammer, and the decorative features are produced by the form given to the mould used for casting, or by means of *repoussé* work, enamel, and chasing. A preference seems to have been shown for spiral curves of all kinds. Such curves appear to the greatest advantage in *repoussé* work, the effect of light and shade obtained by the continually varying direction of the curve and ever-changing amount of relief and breadth of the raised portion being very pleasing to the eye. It is almost impossible to give any idea by a written description of the appearance produced, but the character of this peculiar style of decoration is well illustrated by the example shown on the accompanying woodcut (fig. 1), which shows a circular bronze disc of unknown use,<sup>2</sup> now in the British Museum.

<sup>1</sup> *Proc. Soc. Ant. Scot.*, vol. xvii. p. 225.

<sup>2</sup> Similar discs are to be found in the Museum of the Royal Irish Academy at Dublin (see Catalogue, p. 137).

The groundwork of the ornament is a flat surface of metal, the curves being in relief. The section of the raised portion, if cut across, would be like that of a simple form of architectural moulding with a sharp edge, the object of which is to define the curve and separate the bright side from the one in shadow. The curve is close coiled when starting from the centre, but it soon runs off tangentially, the moulding of which it is

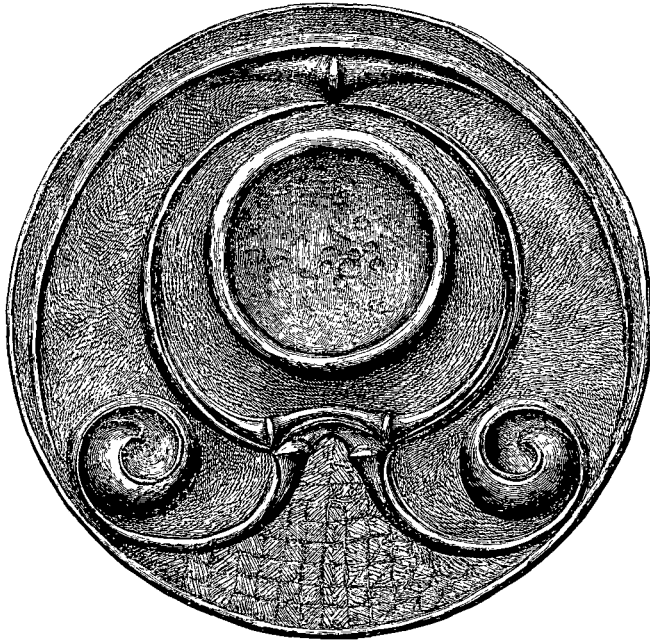
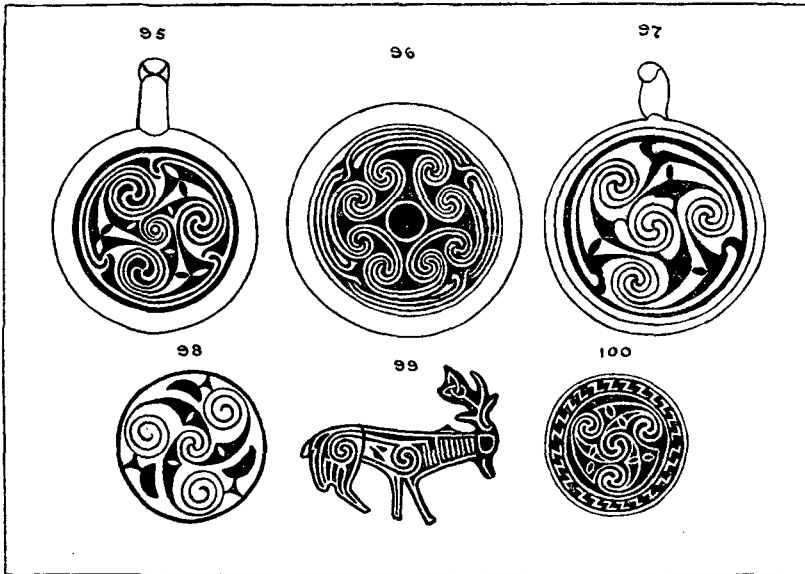


Fig. 1. Circular Disc of Bronze (10 inches diameter).

composed gradually expanding and terminating in a little raised lump, the whole having the appearance of the end of a trumpet. This terminal lump catches the light, and looks in shape like an almond. In the spiral-work of Christian times, drawn on a flat surface, this almond shape at the end of the expanded portion is still retained, being shown white on a black ground. As the play of light and shade on an

arch moulding is more beautiful than on a straight moulding, so the subtlety of the effect is again increased when the moulding is on the curve, and also alters its section, as is the case in the Celtic *repoussé* work (see fig. 1). Besides the resemblance just pointed out between the *repoussé* metal-work of pagan times and the ornamentation of the MSS. of the Christian period, there are instances of enamelled circular discs being found whose decoration corresponds still more nearly with



Figs. 95-100. Spiral Patterns in Enamelled Metal-Work.

that of the MSS. It is unfortunate, however, that the circumstances under which these objects have been found give no clue as to their age. In one case the enamelled disc was associated with a burial in a tumulus, the body being uncremated. As, however, mound-burial survived in this country as late as the eighth century, the date of the object in question is doubtful. The following are the instances I have been able to collect of spiral ornament similar to that of the early Celtic

MSS. occurring upon enamelled metal-work. In the year 1788 the Rev. Mr Pegge opened a tumulus upon Middleton Moor, in Derbyshire, in which he found an unburnt body buried on the natural surface of the ground and lying east and west. Near the point of the shoulder of the skeleton was a circular disc of copper  $2\frac{1}{4}$  inches in diameter, enamelled with a spiral pattern, and having a hook for suspension (see fig. 97). There were also found in the barrow a broken piece of a buckle or personal ornament enamelled with spirals, and a piece of bronze with a fillet round the edge.<sup>1</sup> These objects were at one time in the White Watson Collection, and were afterwards transferred to Mr Thomas Bateman's museum at Lomberdale House, Derbyshire.<sup>2</sup>

In the museum of the Warwickshire Natural History and Antiquarian Society, at Warwick, are some relics discovered at Chesterton, near the Foss Way, and presented by Lord Willoughby de Broke, amongst which are four circular discs of bronze ornamented with spiral patterns in red and white *champlevé* enamel. They are in pairs, the discs forming each pair being identical in every aspect. The discs belonging to one pair are furnished with hooks<sup>3</sup> (see fig. 95), and the other two are without projection of any kind, and are  $2\frac{1}{2}$  inches in diameter<sup>4</sup> (see fig. 96).

In 1862 an enamelled disc, with a spiral design upon it, was found near the old Tilt Yard at Greenwich, and fell into the possession of Mr J. Brent, F.S.A.<sup>5</sup> (see fig. 98).

In the British Museum are two enamelled discs of a similar kind, but there being no catalogue of this collection I am unable to add further particulars.

In the year 1860 some labourers, who were digging for brick earth at Lullingstone, in Kent, discovered a bronze bowl, ornamented with pieces of metal cut out into various shapes, and riveted on to the body of the vessel. The decoration consists of figures of stags and birds, together

<sup>1</sup> *Archæologia*, vol. ix. p. 189.

<sup>2</sup> *Catalogue of Mr Bateman's Museum*, p. 154; and Bateman's *Vestiges of the Antiquities of Derbyshire*, p. 25.

<sup>3</sup> *Jour. Brit. Archæolog. Inst.*, vol. ii. p. 62.

<sup>4</sup> *Jour. Brit. Archæolog. Assoc.*, vol. iii. p. 282.

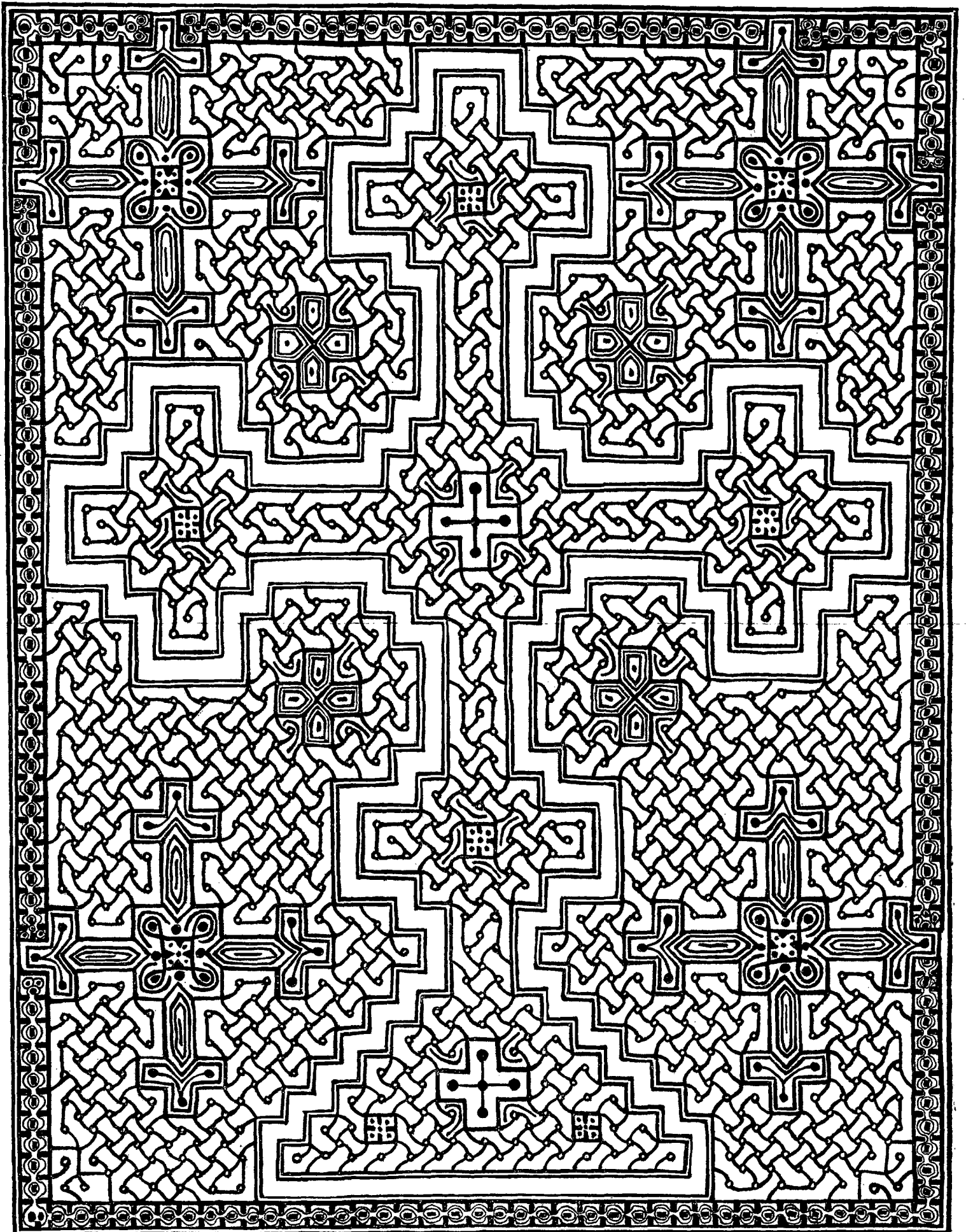
<sup>5</sup> *Proc. Soc. Ant. Lond.*, vol. ii. 2nd series, p. 202.

SPECIMEN PAGE OF ILLUMINATED NESTORIAN MANUSCRIPT.

(Drawn for Rev. Dr CUTTS by SHAMASHA JOHANAN, Cousin of the Patriarch.)

*Proceedings Soc. Ant. Scot.*

*Vol. XIX., to face p. 257.*



THEO. GUYOT. Del. & Sculp.

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FAC SIMILE From original drawing.

with circular discs having spiral patterns in dull red enamel<sup>1</sup> (see figs. 99 and 100). This beautiful specimen of art metal-work is in the possession of Sir P. Hart Dyke of Lullingstone Castle.<sup>2</sup>

It has been shown that spiral ornament occurs upon most of the metal-work of the pagan period, and it is possible also that some of the specimens of spiral patterns in enamel are pre-Christian. The other two forms of Christian Celtic geometrical ornament, namely, interlaced-work and key patterns, are not as far as I am aware, to be found on any work of art prior to the sixth or seventh century, and therefore they must either have been developed from simple elements in the country itself, or else the style of art must have been imported from some foreign source. The early copies of the Gospels came from the East, and it is not unreasonable to trace the origin of the geometrical forms of Christian Celtic ornament to the same source. Religion and art are intimately connected, and the introduction of a new religion has always given an abnormal development to art. The two great schools of Eastern religious art are the Buddhist and the Mohammedan, in both of which geometrical ornament plays an important part. Key patterns are used largely by the Buddhists of China, and they are in most instances founded upon the swastika emblem. The most typical ornament of this class is shown on fig. 15B. It is used very largely by the Chinese for a background to act as a foil to the more unconventional and natural parts of the design, much in the same way as the pattern shown on fig. 14 is used on the early sculptured stones of Scotland. The Mohammedans being forbidden to imitate natural forms in their decorative arts, for fear of encouraging idolatry, fell back upon ornamental developments of writing and geometrical patterns of the greatest intricacy, amongst which interlaced-work and key patterns figure largely. The Nestorian Church has preserved from very early times the custom of ornamenting their MSS. of the Gospel with interlaced-work; and some of the cross pages at the commencement of the Gospels produced at the present day might almost be mistaken for the illuminations out of an Irish MS. of the

<sup>1</sup> Westwood's *Miniatures*, pl. 53 and p. 153.

<sup>2</sup> *Archæologia Cantianæ*, vol. iii. pl. 1.

eighth century. The Nestorians also<sup>1</sup> use interlaced-work in the architectural features of their churches.

The Coptic Churches of Egypt<sup>2</sup> and the Churches of Abyssinia use interlaced-work in their decoration. The only other external source, besides the East, to which it is possible to trace Celtic forms of geometrical ornament is Roman art, which in its turn was derived from the Greeks. The geometrical patterns used by the nations of classical antiquity, although very simple and effective, were few in number, and repeated with unvarying monotony. Plait-work occurs on Roman works of art, and the Greek fret (see fig. 4) is well known throughout the whole of the civilised world. In classical times mere ornament was always made subservient to the arts of painting and sculpture, whereas amongst the Celts the very opposite was the case. The ornamental portions of the designs of Celtic works have never been surpassed for ingenuity, complexity, and beauty of execution; but the figure sculpture and painting of this country, before classical influence made itself felt, is so bad as almost to be beneath criticism. Roman pavements have been suggested as the source whence the Celtic artist drew his inspiration; but there are two very strong arguments against this view—(1) that the Romans did not penetrate into Ireland, whence all Christian Celtic art originally sprung; (2) that if the Roman pavements had been studied the figure drawing would have been studied as well as the ornamental features, and the latter would have shown marks of classical influence, and therefore not have been so bad as it is.

Perhaps the feeblest suggestion as to the origin of Celtic interlaced-work is that of an antiquary, who traces it back to the basket-work and wattled dwellings of the ancient Britons,<sup>3</sup> ignoring the fact that none of the patterns seen on the stones or in the MSS. are in the least like the ordinary system of wattle-work, and that with the exception of the plait, none of them could be reproduced in cords or wattles of any kind, as when drawn tight the shape would disappear, and the whole

<sup>1</sup> *Christians under the Crescent in Asia*, by the Rev. E. L. Cutts.

<sup>2</sup> Butler's *Coptic Churches of Egypt*.

<sup>3</sup> *On the Ancient Sculptured Stones of Scotland, Ireland, and the Isle of Man*, by Gilbert G. French; *Jour. Brit. Archaeolog. Assoc.*, vol. xv. p. 63.

become a mere tangle. The Celtic interlaced-work consists, in fact, not of knots that can be tied practically, but of curved lines passing under and over each other at regular intervals.

To sum up, then, spiral-work is found in works of pagan art, and its origin is therefore within the country itself, and comes down from the Bronze Age, to which it is necessary to go back to find similar designs on the Continent within the classical area, as at Mycenæ.<sup>1</sup> Spiral work does not exist either in Mohammedan or Buddhist art. Key patterns and interlaced-work are possibly of Eastern origin originally, being introduced at the same time as the copies of the Gospels, but becoming subsequently so modified and developed by the natural Celtic aptitude for ornamental design as really when combined with other elements of indigenous growth, to form a new style which it is impossible to confound with any other. Celtic works of art of the Christian period consist of the illuminated pages of MSS. (chiefly copies of the Gospels and Psalters), ecclesiastical metal-work (such as shrines of bells, books, and relics, croziers, processional crosses, chalices, &c.), personal ornaments of metal (such as penannular brooches), sculptured stones (such as memorial and other crosses), and lastly, a few miscellaneous objects of ivory, bone, wood, and leather.

The chief characteristics of the Celtic style of art in Christian times are as follows: namely, first and foremost, the practice of arranging the ornament in panels, each complete in itself and separated from the next, and entirely surrounded by a marginal frame, consisting in the case of the MSS. of a series of broad and fine lines and sometimes rows of dots; in the case of metal-work, of a raised border with twisted wire or other ornamental beading inserted in the angle; and in the case of stone-work, of a round bead or cable moulding, the panel being sunk below the level of the rest of the design.<sup>2</sup> These panels are filled in either with the geometrical forms of ornament already referred to, or with figures of dragons, serpents, and other animal shapes, whose bodies, limbs, and tails are twisted in all directions, and intertwined in every

<sup>1</sup> Dr Hy. Schliemann's *Mycenæ*, pp. 166 to 169, 203, 301, 311, &c.

<sup>2</sup> The patterns on the crosses of the Isle of Man are not divided into panels, showing the effect of Scandinavian influence.



possible way. In later times foliageous scroll-work is also added. On the Scottish sculptured stones, symbols and hunting scenes occur; and in the Book of Kells, figures of birds and animals, drawn unconventionally, are introduced into the ornament. On the high crosses of Ireland, and on some of the Northumbrian crosses, Scripture scenes form part of the decorative features. The colours used in the illuminations of the MSS. are yellow, red, green, blue, purple, all very bright, the yellow especially, which is perhaps the most typical colour of all. Shading is but seldom used, although examples of it occur in the Book of Kells and the Lindisfarne Gospels. The colours of the figures and drapery are put on chiefly with a view to decorative effect, and with entire disregard of the actual colours of the object represented. In the drapery of the figures of the Evangelists, &c., several different colours are used, one being separated from the other with a band of yellow, having a fine black line on each side. The general effect is that of a bright Eastern carpet or a stained glass window. The drawing of the hair is very peculiar, consisting of a large number of separate locks curled up at the end. This method of representation is also to be seen on the heads which adorn the carved capitals in early Irish architecture. The ear and nose are indicated conventionally by spiral lines. An example of the ears and eyes of animals being treated in a similar manner occurs upon the cross at St Madoes, in Perthshire. The ornamental features of the MSS. are all carefully outlined in black ink and coloured. The groundwork of the interlacements of key patterns and spirals is generally black. In the case of interlaced-work, the panel containing it is divided into blocks of different colours. Key patterns are often coloured in alternate squares like a chess-board. Each of the separate bands forming a spiral is coloured differently. The effect sought in the ornament is the same as that in the case of the figure subjects, namely, that of a mosaic of bright colours.

Of the early development of Christian Celtic art, hardly anything is known, and although more light may be thrown on the subject by careful comparison of the ornamental, palæographical, and other peculiarities of the MSS. and sculptured stones, yet it is probable its origin will always be more or less veiled in obscurity. The development

must at any rate have been very rapid, and took place between the end of the fifth century, when Christianity was introduced, and the end of the seventh century, when the Gospels of Lindisfarne<sup>1</sup> was produced, containing all the most elaborate forms of Celtic decoration, and indicating that the highest pitch of excellence of the style had been attained. A great many very misleading statements have been made as regards the date of Celtic works of art, the fact being that there are only a very few specimens whose age has been satisfactorily ascertained from historical data. These, however, will form landmarks to guide the student. It is possible that some of the Irish illuminated MSS. may be as early as the sixth century, but the first MS. containing Celtic forms of ornament, whose date is known without doubt, is the Lindisfarne Gospels (A.D. 698 to 721). Although written in Northumbria and illuminated by Saxons, the ornament is almost purely of Celtic origin.<sup>2</sup> The other MSS. which serve as landmarks of the style are the Gospels of Mac Regol, in the Bodleian Library at Oxford (A.D. 820), the Gospels of Mac Durnan in the Archiepiscopal Library at Lambeth, and the Gospels of Maol Brighte in the British Museum (A.D. 1138). The Stockholm Gospels is proved by entries in the volume to be earlier than A.D. 871 to 889; and the Shrine of the Book of Durrow is of date A.D. 877 to 916, so that the volume itself must be at least as old as the ninth century. From the study of the ornamental features of the above MSS., it would seem that, although there was not much change in the style of illumination between the seventh and the tenth century, yet in the latter portion of this period spiral-work was less frequently used, and the key patterns became more elaborate. Finally, in the fourteenth century, although interlaced-work was still retained in the initial letters, all the other forms of ornament had disappeared. As regards sculptured Celtic stone-work, the evidence of dated examples goes to show that the forms of ornament were developed in the MSS. first, and applied to stone-work later, but there is really no reason why

<sup>1</sup> Now in the British Museum.

<sup>2</sup> The Gospels of St Mulling and the Book of Dimma Mac Nathi are attributed to the seventh century on historical evidence, but not of nearly so satisfactory a nature as in the case of the Gospels of Lindisfarne, and the illuminations are very poor.

some of the sculptured stones may not be at least as old as the Lindisfarne Gospels—that is to say, of the seventh century. The chief landmarks for the study of Celtic sculptured stone-work are the tombstone of St Berechtaire of Tullylease (A.D. 839), the tombstones of Suibne (A.D. 887), and St Fiacraich (A.D. 921), at Clonmacnois, the high crosses of Clonmacnois (A.D. 914), of Monasterboice (A.D. 924), and Tuam (A.D. 1106). The styles of decoration of the Celtic stone-work in various parts of Great Britain differ far more than the styles of the MSS. There are the flat tombstones of Clonmacnois and other places in Ireland, with crosses generally inscribed, and with but little ornament, chiefly confined to the centres and ends of the limbs of the crosses. There are the high crosses of Ireland, with the most elaborate forms of geometrical ornament, such as key patterns, raised crosses of spiral-work and interlacements, together with figure subjects, and scenes from Scripture. There are the high crosses of Iona and Kildalton, in Islay, of similar design to the foregoing, and possibly of the same date, but yet with local peculiarities which mark them off as a separate group. There are the erect cross slabs of the north-east of Scotland, whose ornamentation comes nearer to that of the illuminated pages of the MSS. than that of any of the sculptured stones in other areas, and having raised bosses of spiral-work similar to the high crosses of Ireland, key patterns, interlaced-work, figure subjects, and symbols. There are the Celto-Northumbrian stones of the south of Scotland and north of England, with key patterns, interlacements, foliaceous scroll work, and figure subjects, but an entire absence of spiral designs. There are the Celto-Scandinavian crosses of the Isle of Man and west coast of Cumberland without panelling, having scaly dragons, interlaced-work, ring patterns, key patterns, figure subjects, and generally inscribed in Runes, the names mentioned being in some cases Celtic, and in others Scandinavian. There are the circular-headed crosses of Wales, with key patterns and interlacements, often having Latin inscriptions in Irish minuscules. There are the cylindrical pillar crosses of the north of England. Lastly, there are the West Highland crosses of post-Norman times, with foliaceous scroll-work, and remains of early Celtic forms which have survived in a degraded shape.

The dated specimens of Celtic metal-work are later than the MSS., the chief examples being the Shrine of the Book of Durrow (A.D. 877 to 916), the Shrine of the Book of Armagh (A.D. 937), Maelbrigde's Bell Shrine (A.D. 954), the Crozier of Kells (A.D. 967 to 1047), Shrine of St Molaise Gospels (A.D. 1001 to 1025), Shrine of the Stowe Missal (A.D. 1023 to 1764), Shrine of Columba's Psalter (A.D. 1084 to 1106), Shrine of Dimma's Book (A.D. 1120 to 1220), processional Cross of Cong (A.D. 1123), Shrine of St Lachtin's Arm (A.D. 1160), Shrine of St Patrick's Tooth (A.D. 1376). In addition to the above, mention is made of several works of metal in the Annals of the Four Masters between the years A.D. 734 and 884. Some of the most beautiful specimens of Celtic metal-work are the penannular brooches, but unfortunately the date of none of them has been ascertained. The penannular brooch found at Croy, Inverness-shire, was associated with a silver penny of Coenwulf, king of Mercia (A.D. 795 to 818).<sup>1</sup> The chief peculiarity introduced in the metal-work which does not occur in the stone-work, and of course could not occur in the MSS., is the practice of making incisions with facets in the triangular and other spaces left between the bands of the interlaced-work or between the spirals.<sup>2</sup> This kind of incised ornament is to be seen in Norman architecture occasionally, the hollow produced being the shape of an inverted pyramid. Of the three kinds of geometrical decoration on metal-work interlacements occur most frequently, spirals occasionally, as on the back of the Tara brooch, and key patterns very rarely.

Besides the MSS., the sculptured stones, and the metal-work, a few miscellaneous objects of ivory, bone, wood, and leather, with Celtic forms of ornament upon them, are to be found in Museums.

#### KEY PATTERNS.

Key patterns are so called from their resemblance to the alternations of black and white which are to be seen on that part of a key which is

<sup>1</sup> *Scotland in Early Christian Times*, 2nd series, p. 24.

<sup>2</sup> See *Catalogue of the Royal Irish Academy*, p. 575; and penannular brooch in the Bergen Museum, figured in *Scotland in Early Christian Times*, 2nd series, p. 31.

cut away in L-shaped holes to allow them to pass the wards of the lock.<sup>1</sup>

Key patterns are entirely composed of straight lines, so arranged as entirely to cover the space to be ornamented, being drawn in black upon a white ground. Between each black line is a white line, separating it from the one next to it; and if the black and white were reversed, a fresh key pattern would be obtained.

A key pattern may therefore be defined as one so drawn that the pattern itself consists of straight black lines on a white ground, and the ground consists of straight white lines on a black ground, one being the converse or reciprocal of the other. One set of lines is always continuous, and can be drawn without removing the pen from the paper; whereas the other set, which form the ground, is discontinuous or broken. The labyrinths of the Middle Ages were arranged on the same principle as the lines of a key pattern, the paths being the continuous lines, and the hedges or walls which separated them being the discontinuous ones.<sup>2</sup>

In Celtic key patterns the space to be ornamented is entirely covered with black lines on a white ground, except when the lines intersect at an angle of  $45^\circ$ , and in this case small triangular spaces are left, which are filled in with black. These little black triangles (see fig. 42) give a peculiar appearance to Celtic key patterns, which no others possess. From the definition which has been given of a key pattern, it follows that there are primarily two distinct kinds, namely, (1) key patterns composed of lines branching out at angles of  $90^\circ$ ,  $60^\circ$ , or  $45^\circ$ , from a stem line (see fig. 1); patterns of this class are introduced partially into Celtic ornament (see figs 19, 35, 51, and 52, where the lines first bend round spirally, and then branch out afterwards); and (2) key patterns composed of spirals drawn with straight lines bending round at angles of  $90^\circ$ ,  $60^\circ$ , or  $45^\circ$ , so that for each key pattern formed of straight lines, there is a corresponding spiral pattern formed of curved lines (for instance, the key pattern, fig. 14, is identical with the spiral pattern, fig. 81).

<sup>1</sup> In Cædmon's *Metrical Paraphrase of the Scriptures*, a MS. of the tenth century, in the Bodleian Library at Oxford, a key conventionalised so as exactly to resemble an ornamental pattern is to be seen.—*Archæologia*, vol. xxiv. pl. 58.

<sup>2</sup> See *Jour. Brit. Archæolog. Inst.*, vol. xiv. p. 216; *Assoc. Architect. Soc. Reports*, vol. iv. p. 151; Didron's *Annales Archéologiques*, vol. xvii. p. 119.

All geometrical ornament is based ultimately on the fact that there are only three kinds of regular plane figures with which a flat surface can be completely covered, the figures being placed so that they will fit in any position with their corners meeting at a point, and their sides touching. The figures referred to are the square, the equilateral triangle, and the hexagon. All geometrical ornament is therefore founded on lines drawn at equal distances apart, and intersecting at angles of  $90^\circ$  or  $60^\circ$ ,<sup>1</sup> on the square system, on the equilateral triangle system (the latter including hexagons which are made up of six equilateral triangles). The system founded on squares is the only one which is used in Celtic ornament. Every designer begins by drawing guiding lines, such as those just described; he then fills in each square with special forms of ornament, and finally makes the whole into one design by a series of connecting lines. There are thus three things to be considered in composing an ornamental design—(1) the method of subdividing the space with guiding lines, (2) the method of filling in the lines thus obtained, (3) the method of connecting the figures together, so as to form a complete pattern.

Referring to the diagrams, Plate 1 shows the method of subdividing the space to be ornamented with guiding lines founded on the square system, which way may be done in the following different ways:—(A) squares set parallel; (B) squares set diagonally; (C) squares set diagonally, and every alternate vertical row subdivided into two triangles; (D) squares set diagonally, and subdivided into two triangles; (E) squares set parallel and subdivided into four triangles; (F) squares set parallel, and subdivided into eight triangles.

Plate 2 shows the method of filling in squares with key patterns as follows:—(a) single straight line spiral; (b) double straight line spiral (discontinuous); (c) double straight line spiral (continuous);<sup>2</sup> (d) and (e) patterns used as the centres from which double straight line spirals spring;

<sup>1</sup> Pentagons are largely used in Mohammedan art, but they are placed so that their centres lie in lines intersecting at right angles, and the ornament is thus founded on squares, and not on pentagons.

<sup>2</sup> It will be noticed that (b) and (c) are reciprocal patterns; that is to say, that one is changed into the other by reversing the colours, and making black white.

(f) quadruple straight line spiral, or swastica with two arms, or one bend at right angles; (g) and (h) quadruple straight line spirals, with three arms, or two bends at right angles; (i), (k), (m), and (n) quadruple straight line spirals with four arms, or three bends at right angles; (l) and (o) to (u) quadruple straight line spirals with five arms, or four bends at right angles.

*Note.*—Some of the above variations are produced by bending one arm in the opposite direction to the one which preceded it, or, in other

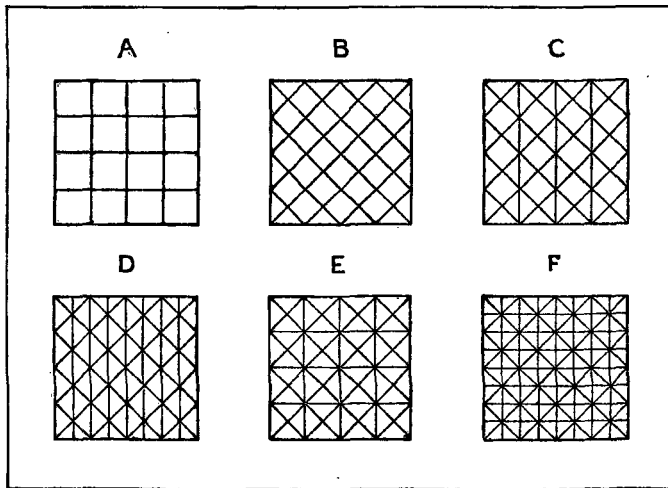


Plate 1. Showing sub-division of Space and Direction of Lines.

words, by reversing the direction of the spiral. The variations given are all that are possible, with from one to five straight lines arranged spirally or swastica-wise. Several of them, such as (f), (g), (h), and (l), occur in Celtic art. Some again are found only in classical ornament, and others only in Eastern art. It is evident that designers have never worked out the theory of geometrical ornament mathematically, and tried to find all the possible variations to be derived from one element, such as the swastica, but have either copied what went before, or have drawn

their lines in the direction suggested by the fancy of the draughtsman at the moment.

All the patterns shown on Plate 2, can be right or left handed, which of course doubles their number when used in combination. The number of variations of the quadruple straight line spirals shown on Plate 2, figs. (f) to (u), is limited by the mathematical theory of permutations

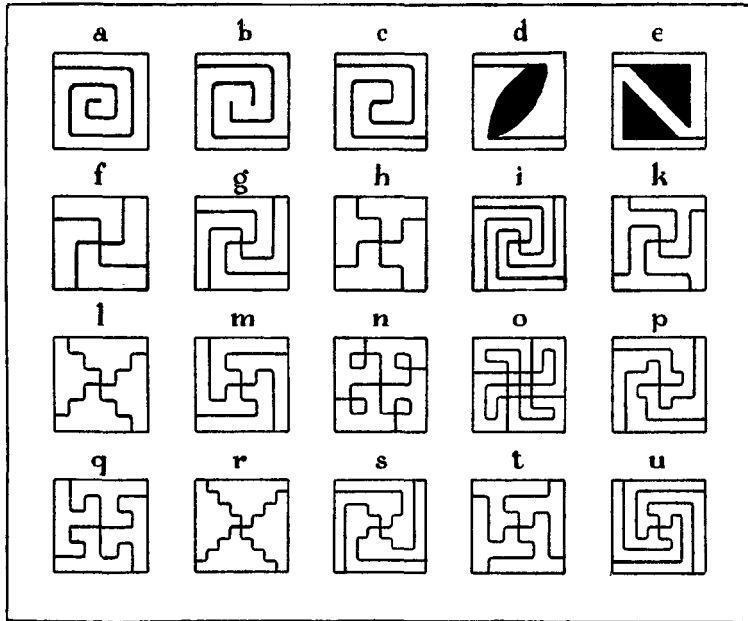


Plate 2. Methods of filling in Squares.

and combinations, and they are obtained thus :—Starting with a simple cross, by adding a second arm, a right or left handed swastica is obtained according to the direction given to the second arm ; from each swastica two three-armed straight line spirals are obtainable on the same principle and from each two, four with four arms, and from each four, eight with five arms, and so on, multiplying by two each time. Some of the



patterns which can be arrived at by working at the subject mathematically are quite unknown, and it says much for the fertility of the imagination of the Celtic artist that so many should have been already discovered. The modern designer seems to be content with mere copying, and is quite incapable of inventing anything new or developing what has gone before, although there is an enormous field open before him. As a single instance, key patterns and spirals of the Celtic type have not as yet

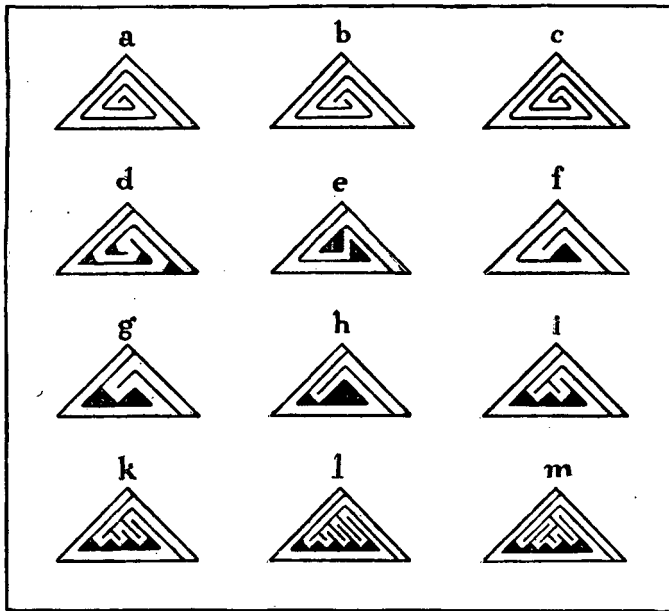


Plate 3. Methods of filling in Triangles.

been applied at all to a surface divided up into hexagons or equilateral triangles.

Plate 3 shows the various methods of filling in half squares or triangles with key patterns, as follows:—(a) single straight line spiral; (b) double straight line spiral (discontinuous); (c) double straight line spiral (continuous); (d) to (h) methods of filling up spaces left between lines

of straight line spirals; (i) to (m) double straight line spirals, one of the lines of which has branches at right angles, the triangular spaces being filled in with black.

*Note.*—The special character of Celtic key patterns as distinguished from others, is due partly to the lines on which the pattern is based running diagonally, but more especially to the method of filling in the little triangular spaces left between the lines with black. Chinese key patterns are often founded on lines running diagonally, but the filling in of the small triangles with black is peculiarly Celtic.

Plate 4 shows the various methods of connecting together squares filled in with straight line spirals. The method of connection is the same whether the squares are set parallel (A, Plate 1) or set diagonally (B, Plate 1). There are two distinct methods of connection employed—(1) where the straight line spirals are connected to each other (Plate 4, figs. I. to IV.), and (2) where the straight line spirals are connected to a central stem in the form of a zig-zag line (Plate 4, figs. V. and VI.). For every method of connecting straight line spirals, there is a corresponding method of connecting spirals composed of curved lines (see figs. 72 to 77).


Fig. I. shows the method of connecting squares filled in with double straight line spirals, and is founded on the principle that a surface may be entirely covered with H-shaped figures, placed in horizontal rows, all facing the same way, but with the sides of the Hs in one row opposite the centres of the Hs in the next row. The Hs correspond in curved spiral work to two C-shaped curves placed back to back, . Here all the squares filled in with straight line spirals are connected together, so as to form a continuous net-work of lines covering the whole surface.

Fig. II. shows the method of connecting squares filled in with quadruple straight line spirals, and is founded on the principle that a surface may be entirely covered with H-shaped figures placed in horizontal rows, facing alternately upwards and sideways. This method of connection corresponds in curved spiral-work to the one shown on fig. 72. Here all the squares filled in with straight line spirals are connected together so as to form a continuous net-work of lines covering the whole surface.

Fig. III. shows the method of connecting squares filled in with double straight line spirals, and is founded on the principle that a surface may

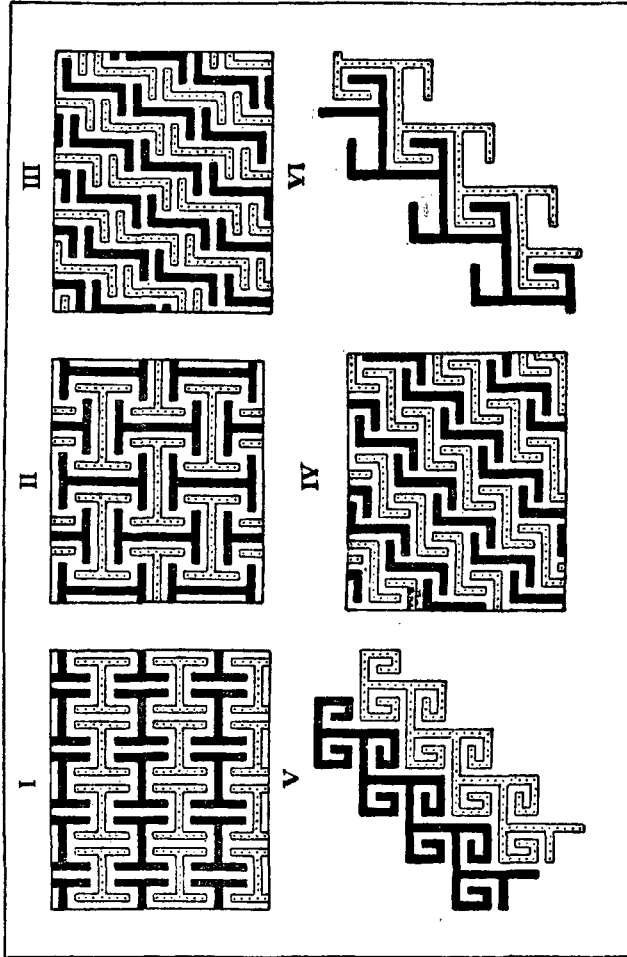


Plate 4. Methods of connecting Squares filled in with Straight line Spirals.

be entirely covered with Z-shaped figures in rows all facing the same way. The Z-shaped figures correspond to S-shaped curves in spiral-

work (see fig. 73). Here the squares filled in with straight line spirals are not at all connected together so as to form a continuous net-work of lines covering the whole surface, but each diagonal row of **Zs** forms a continuous line.

Fig. IV. is the same as the preceding, except that every other row of **Zs** faces sideways.

Fig. V. shows the method of connecting squares filled in with single straight line spirals. A zig-zag line is drawn, following two sides of one square and the two opposite sides of the next, thus forming a stem line from which the spirals branch out right and left. The spirals do not form a continuous net-work of lines covering the whole surface, but each stem with the spiral branching from it is continuous. This method corresponds in curved spiral-work to the one shown on fig. 81.

Fig. IV. is the same as the preceding, except that the straight line spirals are double instead of single, and corresponds in curved spiral-work to that shown on fig. 82.

Plate 5 shows the various methods of connecting squares and triangles filled in with straight line spirals.

Figs. VII. to X. show the methods of connecting squares set diagonally and triangles (fig. C, Plate 1), filled in with straight line spirals.

Figs. XI. and XII. show the methods of connecting triangles (fig. D, Plate 1), filled in with straight line spirals.

*Note.*—The connecting lines are all those in the pattern which do not form part of the straight line spirals, and when the number of turns of the spiral are reduced to nothing, a series of similar figures is obtained entirely covering a surface as shown on (figs. I. to IV. Plate 4). On Plate 5 the spaces between the connecting lines are left blank for the straight line spirals to be filled in; whereas on Plate 4, the numbers of turns of the straight line spirals are reduced to nothing, and the connecting lines all brought up close together.

Figs. 1 to 10 show the various forms of border key patterns, founded on squares set parallel (Plate 1, fig. A), and produced by filling in the squares with single and double straight line spirals (Plate 2, figs. a, b, and c). Other border patterns can be obtained by filling in the squares with quadruple straight line spirals or swastikas. One of these is given

in (fig. 59), where it is classed with the other swastica patterns. Border key patterns founded on squares set parallel, such as those shown on figs. 1 to 10, occur most frequently in classical art, and are commonly known as Greek frets. They are to be found occasionally in Celtic art, the largest number of examples being on the cross slabs of the eighth and ninth centuries at Clonmacnois in Ireland. The method of covering whole surfaces with key patterns founded on squares set parallel, is

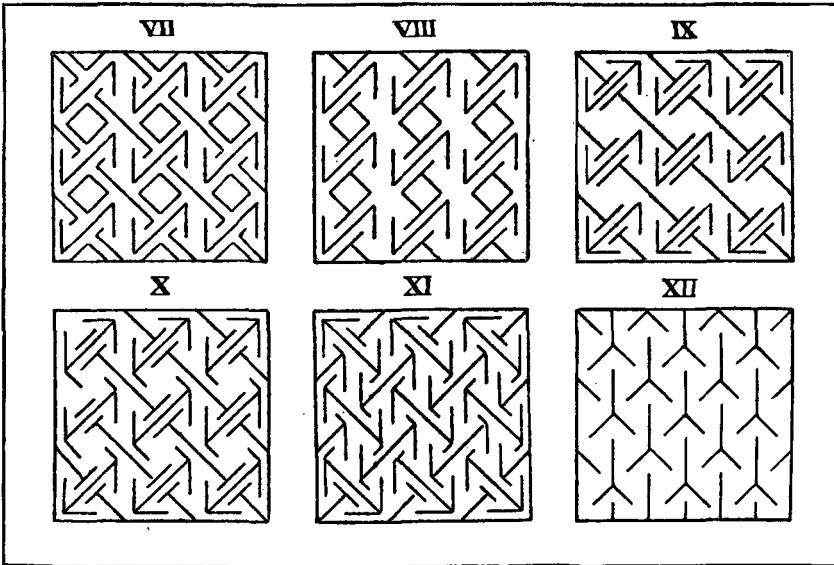
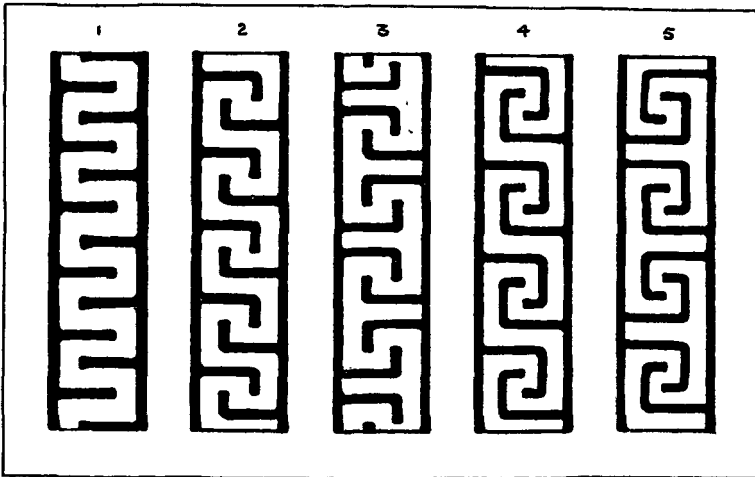


Plate 5. Methods of connecting Squares and Triangles filled in with Straight-line Spirals.

the same as when the squares are set diagonally (see figs. 11 and 14), as hereafter explained. This class of key pattern looks far better when the squares are placed diagonally, which is almost always the case, except in a few instances, when the two kinds of ornament are used to contrast one with the other, as on the Rosemarkie Cross, Inverness-shire, where the design on two of the panels round a cross consist of square key patterns set diagonally, whilst on the other two panels they are set parallel.

Fig. 1 is the simplest kind of border key pattern founded on the system of squares set parallel (fig. A, Plate 1), and it is probable that the more complicated forms were developed from it. It is produced by drawing straight strokes facing each other alternately to the right and left, at right angles to the two parallel lines at each side of the border.

Figs. 2 and 4 are founded on squares set parallel (fig. A, plate 1), and filled in with double straight line spirals (fig. b, Plate 2), all the spirals having the same direction of twist, and can be developed from fig. 1 by



Figs. 1 to 5. Single Border Patterns formed by filling in Squares set parallel (A).

adding fresh strokes at right angles. The lines which connect the spirals form the sides of the border.

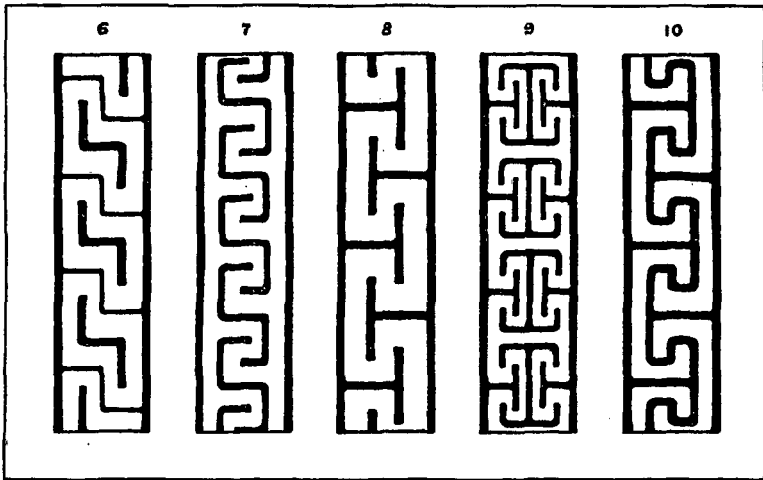
Figs. 3 to 5 are the same as the preceding, except that the spirals are alternately right and left handed, instead of all having one direction of twist.

Figs. 6 and 7 are founded on squares set parallel (fig. A, Plate 1), and filled in with double straight line spirals (b, Plate 2), all having the same direction of twist, and connected to each other, instead of to the lines forming the border.

Fig. 8 is the same as the preceding, except that the spirals twist alternately in opposite directions instead of all being the same, and are connected to the lines forming the border as well as to each other.

Fig. 9 is a double border pattern similar to the preceding, but the spirals connected by **H** and **T**-shaped lines according to method (fig. I. Plate 4).

Fig. 10 is the same as fig. 8, except that the spirals are continuous (fig. a, Plate 2), instead of broken (fig. b, Plate 2).



Figs. 6 to 10. Single Border Patterns formed by filling in Squares set parallel (A).

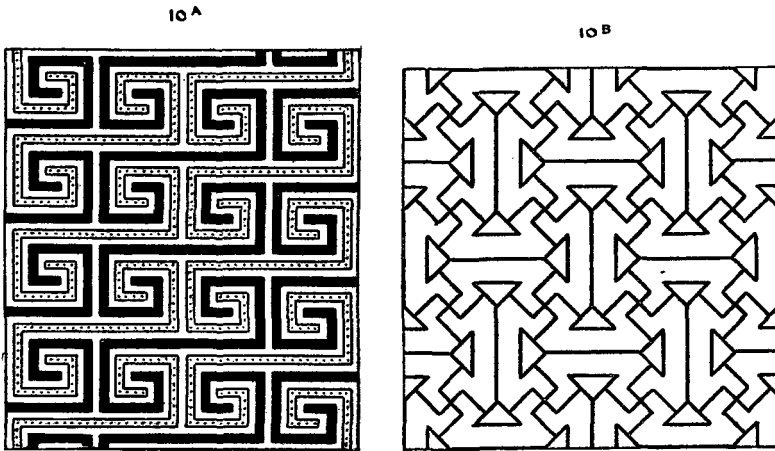
Fig. 10A is a surface key pattern founded on squares set parallel (fig. A, Plate 1), and filled in with double straight line spirals (fig. b, Plate 2), the method of connection being that on (fig. III. Plate 4).

Fig. 10B is a surface key pattern founded on squares set parallel (fig. A, Plate 1), and filled in with swastikas placed diagonally.

Figs. 11 to 15 show the various forms of surface key patterns founded on squares set diagonally (fig. B, Plate 1), and filled in with single or double straight line spirals (figs. a to e, Plate 2), the methods of connection being shown on Plate 4. The simplest method of connection

is that shown on (fig. V. Plate 4), and used in forming the key pattern on fig. 14, which is taken from the cross page at the commencement of St John's Gospel in the Book of Lindisfarne,<sup>1</sup> and is therefore as old as the eighth century. This is the surface key pattern which occurs with greater frequency than any other upon the Scottish sculptured stones, there being at least twenty-four examples. It is used by the Celtic artist as a background to cover a large surface, much in the same way that the Chinese use their favourite key pattern (fig. 15 B).

Fig. 15A, which shows one of the arms of the cross at Dunfallandy,



Figs. 10A, 10B. Patterns formed by filling in Squares set parallel (A).

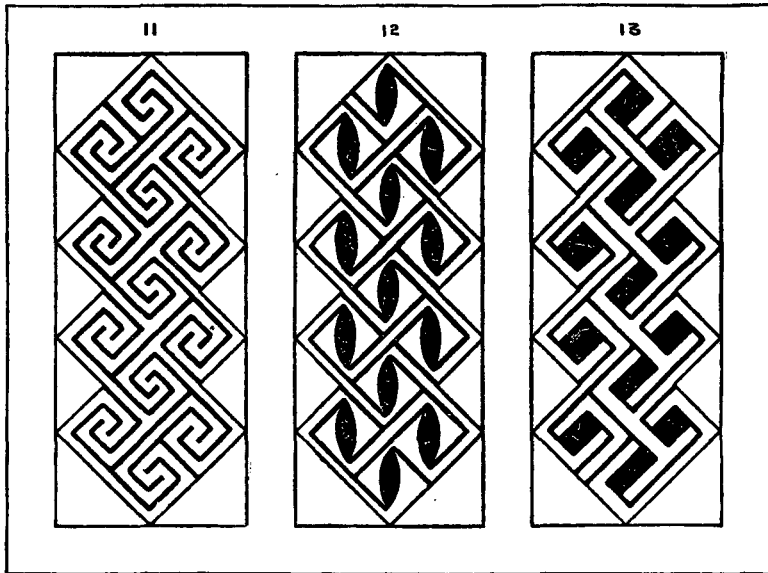
in Perthshire, may be compared with fig. 15B, which is from a Chinese book of ornamental designs. In both cases the object sought is to produce a pleasing contrast between the stiff lines of the key pattern and the gracefully flowing lines of the raised bosses of spiral-work on the sculptural stones, or the unconventional portions of the Chinese design. The curved lines are concentrated on a small space, generally circular in shape, whilst the key pattern forms the background.

<sup>1</sup> *Palaeographical Soc. Publications*, pl. 5.



Squares set diagonally (fig. B, Plate 1), and filled in with either double or quadruple spirals (figs. b and f, Plate 2), are very seldom used, but the method of forming the connections is shown on (figs. I. to IV. and VI., Plate 4).

The triangles left at the sides of all the patterns belonging to this group, in consequence of the squares being set diagonally, are in the



Figs. 11 to 13. Patterns formed by filling in Squares set diagonally (B).

MSS. generally filled in with a plain wash of colour, and on the stones with some of the triangular key patterns shown on Plate 3.

Fig. 11 is founded on squares set parallel (Plate 1, fig. B), and filled in with double straight line spirals (Plate 2, fig. b), the connecting lines being H-shaped (fig. I. Plate 4).

Fig. 12 is the same as the preceding, but the squares filled in with pattern (d, Plate 2), and connected with a zig-zag line (fig. VI. Plate 4).

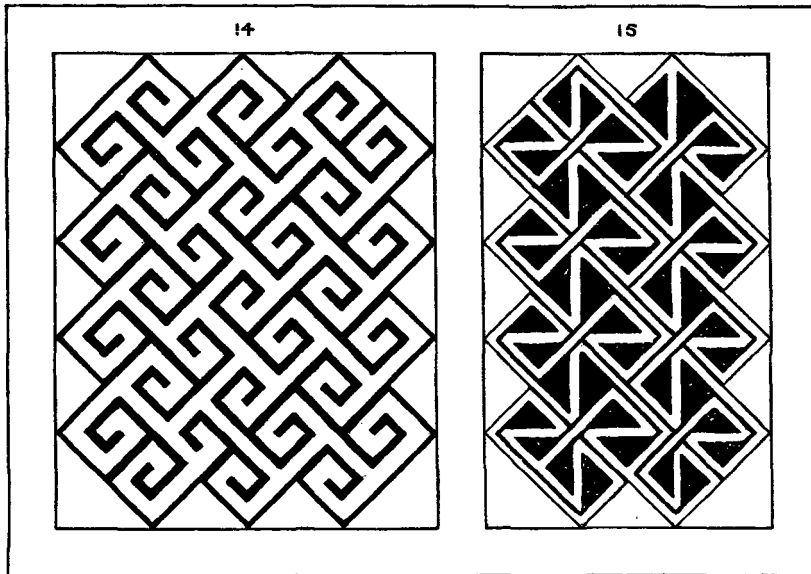
Fig. 13 gives another method of filling in the squares similar to the

preceding, except that the zig-zag connecting line (fig. VI. Plate 4) starts from the bottom instead of from the sides.

Fig. 14 is founded upon squares set diagonally (Plate 1, fig. B), and filled in with single straight line spirals (Plate 2, fig. a), the connecting line being zig-zag (fig. V. Plate 4).

Fig. 15 is the same as the preceding, except that the squares are filled in with pattern (c, Plate 2).

Fig. 15A is founded on squares set parallel (fig. A, Plate 1), and



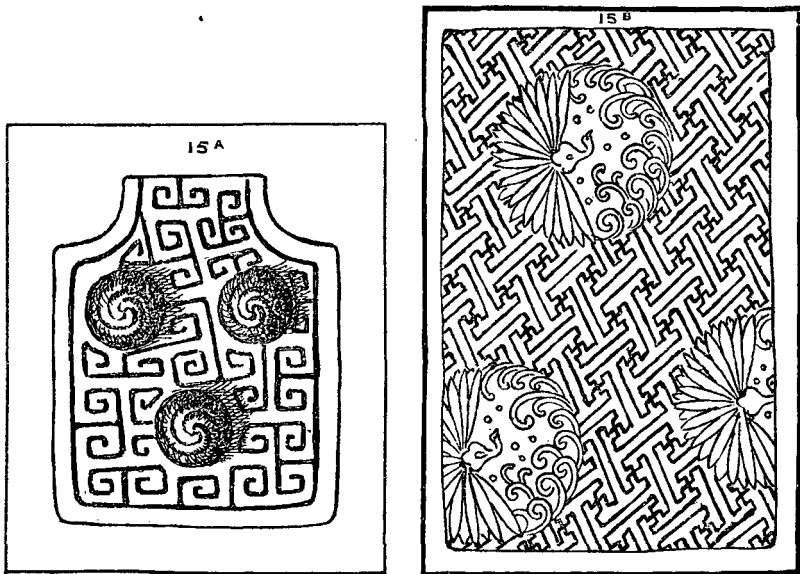
Figs. 14, 15. Patterns formed by filling in Squares set diagonally (B).

filled in with single straight line spirals (fig a, Plate 2). The method of connection is irregular by means of a zig-zag line (fig. V. Plate 4). The key pattern serves as a background to contrast with the raised bosses of spiral-work. The drawing represents the left arm of the cross at Dunfallandy, in Perthshire.

Fig. 15B is founded on squares set diagonally, and filled in with

quadruple straight line spirals (fig. m, Plate 2), the connection being H-shaped (fig. II. Plate 4). The key pattern serves as a background to contrast with the more unconventional portions of the design. The drawing is taken from a book of Chinese ornaments.

Figs. 16 to 29 show border patterns founded upon squares set diagonally, every alternate row being subdivided into two triangles (Plate 1, fig. C), and the squares filled in either with the patterns given



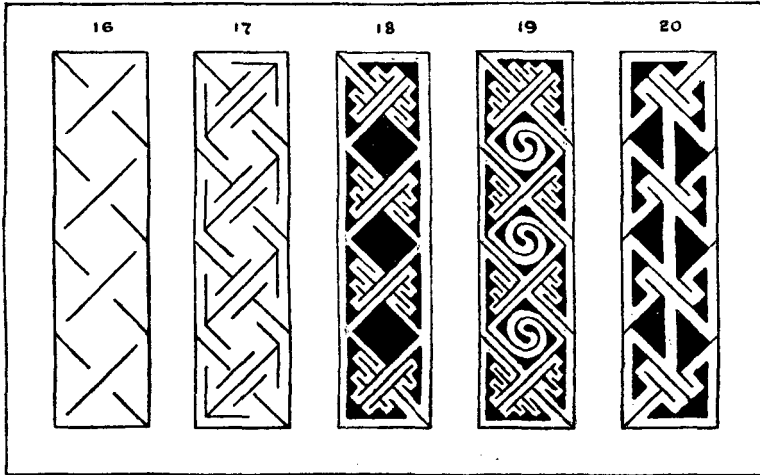
Figs. 15A, 15B. Celtic and Chinese methods of Ornamentation. Left Arm of Celtic Cross at Dunfallandy and Chinese Pattern.

on Plate 2, or with curved spirals, or with plain washes of colour, and the triangles with the patterns given on Plate 2. The connecting lines are Z-shaped (figs. VII. to XI. Plate 5).

Figs. 16 and 17 give the method of drawing the setting out lines for patterns on figs. 19, 23, and 25, and those for the others may be drawn in a very similar manner.

Fig. 18 is founded on squares set diagonally and triangles (Plate 1, fig. C), the squares being filled in with a plain wash of colour, and the triangles with double straight line spiral with branches (Plate 3, fig. k), the method of connection being that shown on (fig. VIII. Plate 5).

Fig. 19 is the same as the preceding, except that the squares are filled in with double curved spirals, and the connecting lines are those shown on (fig. X. Plate 5), but with two arms of the Hs left out, so that the squares can be filled in with double instead of quadruple spirals.<sup>1</sup>



Figs. 16 to 20. Patterns formed by filling in Squares diagonally and Triangles (C).

Fig. 20 has the squares filled in with pattern (e, Plate 2), and the triangles with (g, Plate 3), the connecting lines being those shown on (fig. VII. Plate 5).

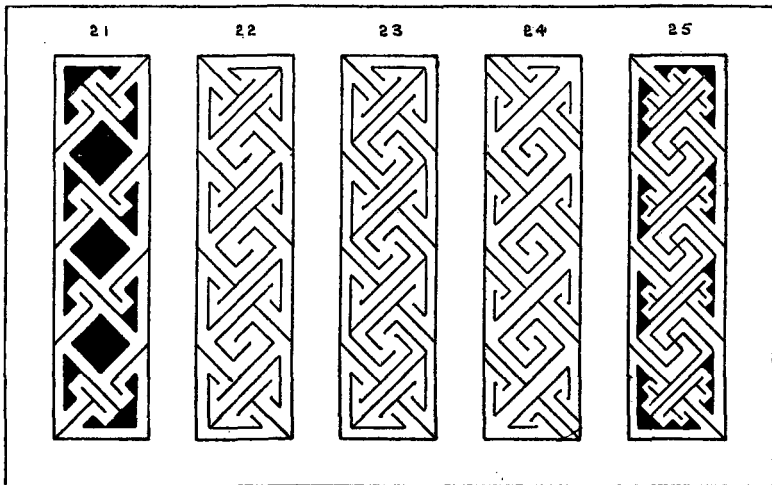
Fig. 21 has the squares filled in with a plain wash of colour, and the

<sup>1</sup> In a similar manner, fig. IX. Plate 5, is derived from fig. X. Plate 5, by leaving out two of the arms of the Zs, so that the squares can be filled in with double instead of quadruple spirals.

triangles with (fig. g, Plate 3), the connecting lines being those shown on (fig. VII. Plate 5).

Fig. 22 has the squares filled in with (fig. b, Plate 2), and the triangles with (fig. b, Plate 3), the connecting lines being those shown on (fig. IX. Plate 5).

Fig. 23 has the squares filled in with a quadruple straight lined spiral, and the triangles with (fig. b, Plate 3), the connecting lines being those shown on (fig. X. Plate 5).



Figs. 21 to 25. Patterns formed by filling in Squares set diagonally and Triangles (C).

Fig. 24 has the squares filled in with (fig. b, Plate 2), and the triangles with (b, Plate 3), the connecting lines being the same as those used for fig. 19, the pattern being black on a white ground, instead of white on a black ground.

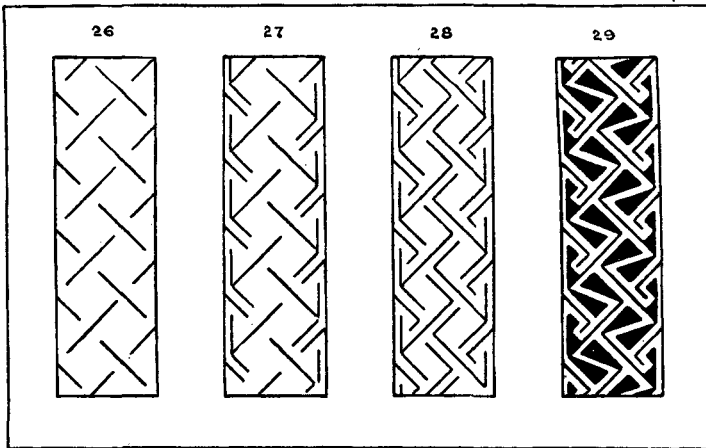
Fig. 25 has the squares filled in with (fig. g, Plate 2), and the triangles with (fig. i. Plate 3), and the connecting lines are those shown on (fig. X. Plate 5).

Figs. 26 to 28 give the setting out lines for drawing fig. 29.

Fig. 29 has the squares filled in with (fig. e, Plate 2), and the triangles with (fig. g, Plate 3),<sup>1</sup> the connecting lines being shown on fig. 28.

Figs. 30 to 35 show single border key patterns, founded on squares set diagonally, and divided into two triangles (Plate 1, fig. D), the connecting lines being those shown on (fig. XI. Plate 5).

Figs. 30 and 31 give the setting out lines for drawing figs. 32 to 35. Fig. 32 has the triangles filled in with (fig. b, Plate 3).



Figs. 26 to 29. Patterns formed by filling in Squares set diagonally and Triangles.

Fig. 33 has the triangles filled in with (fig. d, Plate 3).

Fig. 34 has the triangles filled in with (fig. i, Plate 3).

Fig. 35 has the triangles filled in with (fig. m, Plate 3).

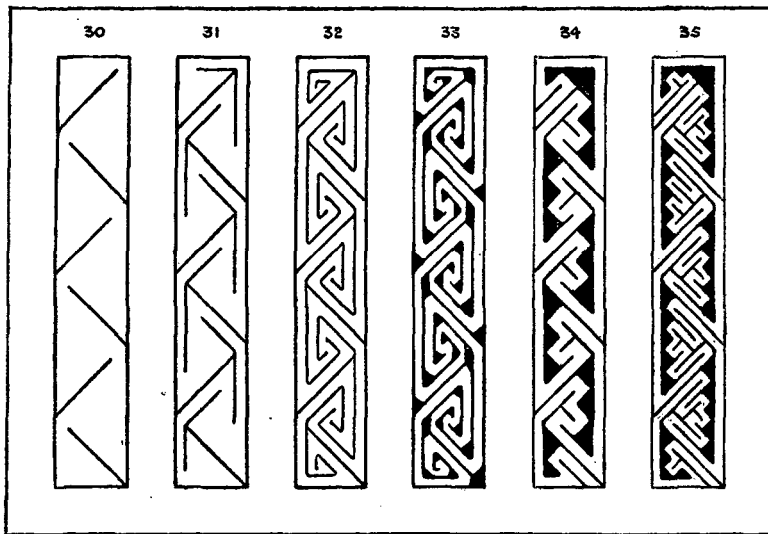
Figs. 36 to 39 show double border key patterns founded upon squares

<sup>1</sup> This pattern is a very peculiar one, and only occurs, as far as I know, upon the cross at Rosemarkie, in Inverness-shire. It was first pointed out to me by Dr Anderson, who sent me a photograph of the stone (taken by Mr D. White of Inverness), without which I should have been unable to have produced a drawing of it, as the plate given in Stuart's *Sculptured Stones* is so inaccurate as to be quite useless for purposes of study.

set diagonally, and divided into two triangles, the connecting lines being Z-shaped (fig. XI. Plate 5), and are drawn on the principle that a surface can be covered with Z-shaped lines as shown on fig. 41, or rather H-shaped lines with two of the lines of the H bent at an angle of  $45^\circ$ . It has already been pointed out how a surface may be covered with H-shaped lines. (Plate 4, figs. I. and II.)

Figs. 36 and 37 give the setting out lines for drawing figs. 38 and 39.

Fig. 38 has the triangles filled in with (fig. h, Plate 3).



Figs. 30 to 35. Patterns formed by filling in Triangles (D) or Half Squares.

Fig. 39 has the triangles filled in with (fig. i, Plate 3).

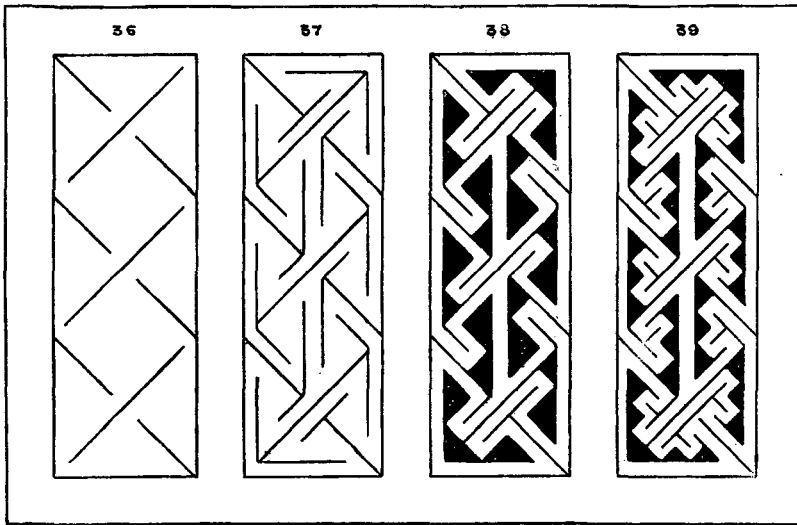
Figs. 40 to 43 show surface patterns founded upon squares set diagonally, and divided into two triangles, the connecting lines being Z-shaped (fig. XI. Plate 5).

Figs. 40 and 41 show the setting out lines for drawing figs. 42 and 43.

Fig. 42 has the triangles filled in with (fig. i, Plate 3). This is perhaps the most characteristically Celtic pattern of all those described. Although not very common upon the sculptured stones, there being

only seven examples in Scotland, one or two in Ireland, and hardly any in England and Wales, it is yet of frequent occurrence in the MSS. It will be found in the Lindisfarne Gospels, the Book of Kells, St Chad's Gospels, and is very largely employed in the Gospels of Mac Durnan.

Perhaps the best example upon sculptured stone-work is on the cross at Rosemarkie, in Inverness. The effect of the little black triangles, which appear on the pattern as drawn in the MSS., is produced in stone-work by deep incisions of the same shape. When the Rosemarkie cross



Figs. 36 to 39. Patterns formed by filling in Squares divided into two Triangles (D).

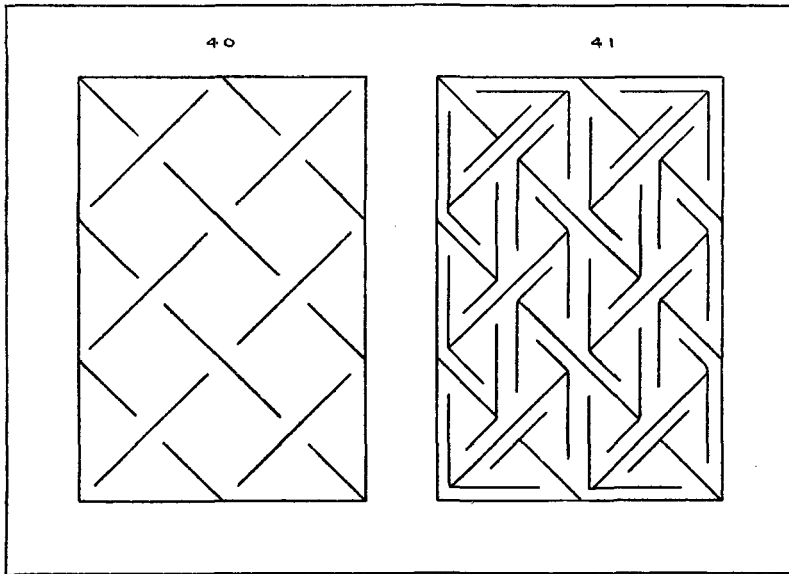
was first carved it must have looked exactly like a page out of one of the best Celtic MSS., but the ravages of the weather have caused the triangular incisions to lose their shape and look like honey-combing. The pattern is a difficult one either to draw or carve, and its occurrence in its most finished form, as at Rosemarkie, indicates that the sculpture is the work of a master-hand. Although but a small fragment, the stone from Gattonside, near Melrose, and now in the National Museum, is a well-executed example of this particular form of ornament, as is also



a small slab on the island of Inchcolm. Professor Westwood calls it the **Z** or Chinese pattern.<sup>1</sup>

Fig. 43 is the same as the preceding, but with the triangles filled in with (fig. e, Plate 3).

Figs. 44 to 47 show double border key patterns founded upon squares set diagonally, and divided into two triangles. The method of drawing



Figs. 40, 41. Patterns formed by filling in Squares divided into two Triangles (D).  
(Setting out lines for Nos. 42, 43.)

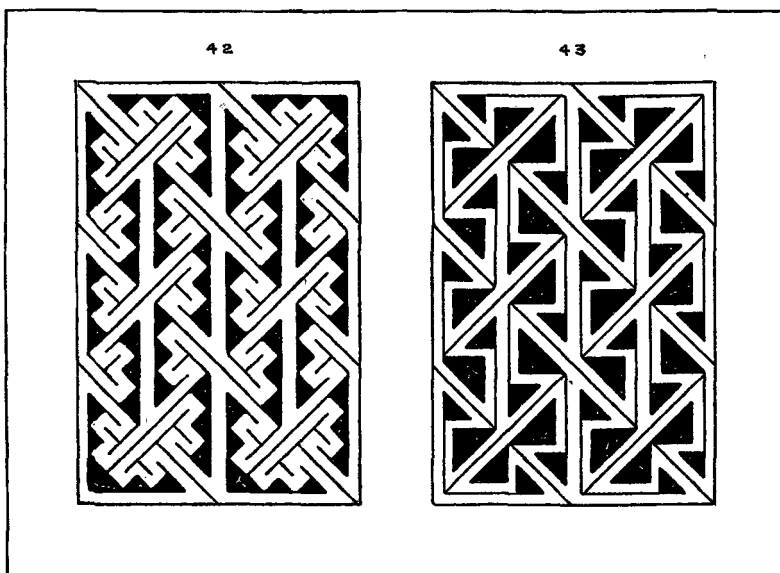
the connecting lines is founded on the fact that a surface may be covered with star-shaped figures formed of three equal lines radiating from a point (fig. XII. Plate 5). In order that the pattern might be perfectly symmetrical, these three lines should make angles of  $120^\circ$  with each other, instead of one being  $90^\circ$  and the other two  $135^\circ$ , as is the case on figs. 44 to 47. These patterns should, in fact, be classed amongst those

<sup>1</sup> *Jour. Brit. Archaeolog. Inst.*, vol. vii. p. 17, and vol. x. p. 275.

founded on the equilateral triangle, and not on the square system. They are not at all common, and are to be found chiefly in the Book of Kells, and on stones in South Wales. There is a very fine example on one of the crosses at Llantwit Major, in Glamorganshire.<sup>1</sup>

Figs. 44 and 45 give the setting out lines for drawing figs. 46 and 47.

Fig. 46 has triangles filled in with (fig. g, Plate 3).



Figs. 42, 43. Patterns formed by filling in Squares divided into two Triangles (D).

Fig. 47 has the triangles filled in a way which is quite peculiar, and only occurs in the Book of Kells.

Figs. 48 to 52 show the methods of producing surface key patterns founded upon squares set parallel and divided into four triangles, the connecting lines being drawn on the principle before explained, that H-shaped figures can be arranged so as to entirely cover a surface (fig. I, Plate 4). These patterns are generally used only to fill in a single

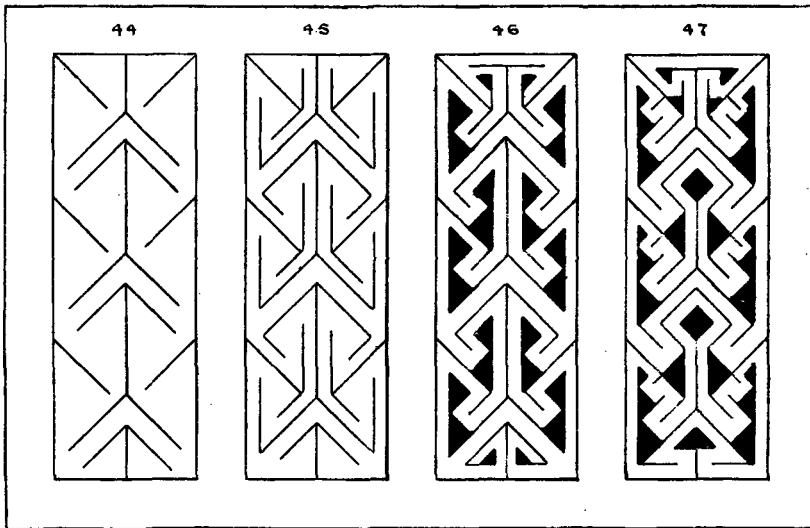
<sup>1</sup> Westwood's *Lapidarium Wallia*, pls. v. and vi., and p. 11.

square, and not as a surface ornament. Exceptions to this rule, however, occur on the cross at Keils in Knapdale,<sup>1</sup> and in the initial page of the Gospel of St Matthew in the Gospels of Mac Durnan.

Fig. 48 gives the method of covering a surface with this class of key pattern, the triangles being filled in with (fig. i, Plate 3).

Fig. 49 has two of the triangles filled in with (fig. f, Plate 3), and the other two with (fig. g, Plate 3).

Fig. 50 has the triangles filled in with (fig. i, Plate 3).



Figs. 44 to 47. Patterns formed by filling in Squares divided into two Triangles (D).

Fig. 51 has the triangles filled in with (fig. k, Plate 3).

Fig. 52 has the triangles filled in with (fig. l, Plate 3).

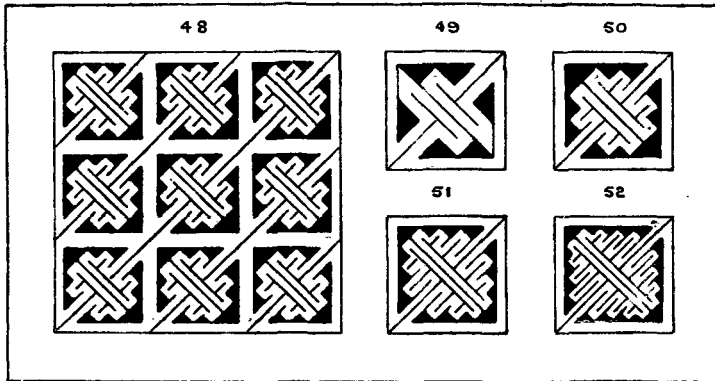
Figs. 53 to 58 show the methods of producing surface ornament founded on squares set parallel and divided into eight triangles (fig. F, Plate 1). These patterns are hardly ever used for covering a surface, but are confined to a single square. The connecting lines are in the shape of a cross.

<sup>1</sup> Stuart's *Sculptured Stones*, vol. ii. pl. xxxii.

Fig. 53 has the connecting line in the shape of a cross placed parallel, and the triangles filled in with (fig. b, Plate 3).

Fig. 54 is the same as the preceding, except that the filling in of the triangles is done in a way peculiar to this particular pattern, which only occurs in the Gospels of Mac Durnan.

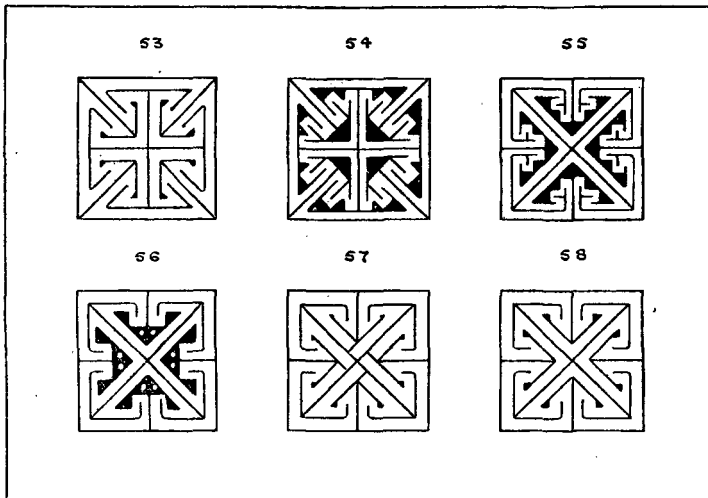
Figs. 55 to 58 have the connecting cross placed diagonally, and the triangles filled in with (fig. g, plate 3) in the case of fig. 56, and with (fig. b, Plate 3) in the case of figs. 57 and 58. The variation on fig. 58, produced by continuing on four of the lines, will be noticed in fig. 57.



Figs. 48 to 52. Patterns formed by filling in Squares divided into four Triangles (E).

Figs. 59 to 65 show key patterns where the quadruple straight line spiral or swastica is used for filling in. They are of more common occurrence in classical and Eastern art than in Celtic art. The swastica being a Buddhist symbol, will account for its so often being used in Chinese ornamental designs, and it appears as one of the forms of the Cross in Christian times. The connection which exists between symbolism and ornament opens up a most interesting field of inquiry, but of too vast an extent to be entered upon here. It is often very difficult to determine where symbolism ends and ornament begins; and also to find whether a mere ornament has in time become a symbol, or

whether what was first symbol has degenerated subsequently into an ornament. The swastica has been used as a symbol from pre-historic times down to the present day; and although a great deal has been written upon the subject, very little seems to be known either as to its origin or meaning. The most reasonable theory is that which connects it with rotary motion (which its arms suggest), either of the sun or of the primitive machine for producing fire by the friction of a swiftly revolving piece of wood.



Figs. 53 to 58. Patterns formed by filling in Squares divided into eight Triangles (F).

The swastica occurs within the classical area on coins,<sup>1</sup> on spindle whorls from Troy,<sup>2</sup> on pottery,<sup>3</sup> in India, on the feet of Buddha;<sup>4</sup> in China, on objects of all kinds; in Scandinavia upon golden bracteates;<sup>5</sup> and on Roman altars found in this country.<sup>6</sup>

<sup>1</sup> *Numismatic Chronicle*, vol. xx. p. 18.

<sup>2</sup> Dr Schliemann's *Troy and its Remains*.

<sup>3</sup> J. B. Waring's *Ceramic Art*.

<sup>4</sup> *The Reliquary*, vol. xxii. plate i.

<sup>5</sup> Prof. Stephen's *Runic Monuments*, vol. ii. p. 524.

<sup>6</sup> Dr Bruce's *Roman Wall*.

As a Christian emblem it is to be found in the Roman Catacombs of the third century,<sup>1</sup> and occurs in Celtic MSS.,<sup>2</sup> and on Celtic sculptured stones;<sup>3</sup> also on metal-work with Anglo-Celtic interlaced patterns.<sup>4</sup> In later times it is used on mediæval sepulchral brasses and vestments,<sup>5</sup> and in the sixteenth century as a bell-founder's mark.<sup>6</sup> It also occurs in Norman sculpture on the moulding of the doorway of Great Canfield, in Essex.<sup>7</sup>

Fig. 59 is a border key pattern founded on squares set parallel (fig. A, Plate 1), and filled in with quadruple straight line spirals (fig. f, Plate 2), all the spirals having the same direction of twist. This pattern, although very common in classical art, only occurs but seldom in Celtic art, as on sculptured stones at Millport, in Buteshire, and at Abercromby, in Fifeshire.

Fig. 60 is founded on squares set parallel and divided into four triangles (fig. E, Plate 1), filled in with pattern (i. Plate 3). It is the same as (fig. 50), except that the straight line spirals with which the triangles are filled in have all the same direction of twist, instead of being alternately right and left handed.

Fig. 61 is founded on squares set parallel (fig. A, Plate 1), and filled in with quadruple straight line spirals (fig. h, Plate 3). The spaces between the lines of the key pattern are filled in with T-shaped figures. The pattern thus formed is a peculiar one. It is only found, as far as I know, in the Book of Durrow,<sup>8</sup> on one stone in Northumberland,<sup>9</sup>

<sup>1</sup> Dr Smith's *Dict. of Christian Antiquities*, p. 497.

<sup>2</sup> Lindisfarne Gospels, *Palæog. Soc. Publ.*, plate v.

<sup>3</sup> In Ireland, on two stones from Glencar, co. Kerry (*Trans. Royal Irish Academy vol. xxvii. p. 41*); on a stone near Clifony, co. Sligo (*Jour. R. Hist. and Archaeol. Assoc. of Ireland*, vol. v. 4th series, p. 376); in the parish of Minard, co. Kerry (Rolt Brash's *Monuments of the Gaedhil*, plate xxiv.); in Scotland on a late grave-slab at Balquhidder, in Perthshire (Stuart's *Sc. Stones*, vol. ii. plate lxvii.; on the Newton stone (*loc. cit.*, vol. i. plate i.); and on a slab from Craignarget, Glenluce (*Proc. Soc. Antiq. Scot.*, vol. xv. p. 251).

<sup>4</sup> Found at Brougham, Westmoreland (*Jour. Brit. Archaeol. Inst.*, vol. iv. p. 63).

<sup>5</sup> *The Reliquary*, vol. xxii. plate v.; J. G. Waller's *Monumental Brasses of England*.

<sup>6</sup> *Reliquary*, vol. xxii. plate vi.

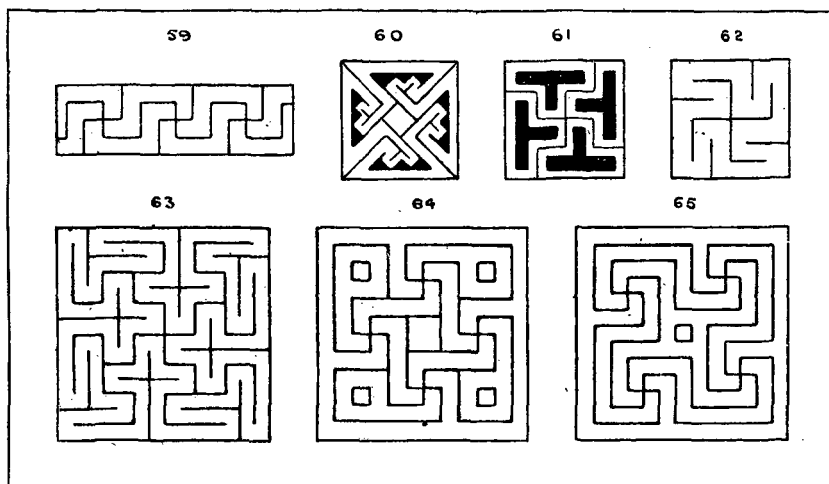
<sup>7</sup> *Essex Archaeol. Soc. Trans.*, vol. ii. new series, p. 377.

<sup>8</sup> Westwood's *Miniatures*, plate vii. It also occurs in the Gospels of MacRegol and the Cologne Penitential.

<sup>9</sup> At Norham; Stuart, *Sc. Stones*, vol. ii. plate xxvii.

and on four stones in South Wales.<sup>1</sup> The ornamentation of the four Welsh stones is similar in other respects, and they all have Latin inscriptions in Irish minuscules, so that they are probably all of the same date, about the ninth century.

Fig. 62 is founded upon squares set parallel (fig. A, Plate 1), and filled in with quadruple straight line spirals (fig. f, Plate 3). This is the swastica symbol, which has been already arranged as a key pattern,



Figs. 59 to 65. Patterns formed by filling in Squares with Straight Lines arranged spirally.

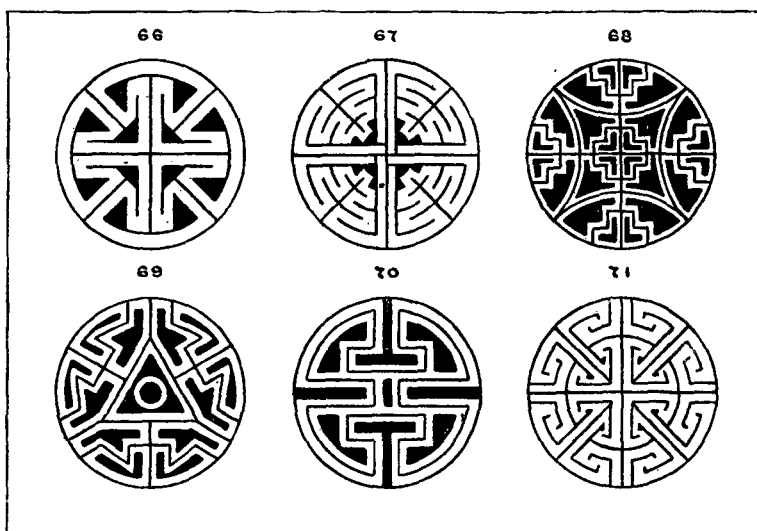
but whether it is intended as a symbol or ornament in Celtic art is doubtful.

Fig. 63 is a further development of fig. 61, and may be looked upon as four plain crosses arranged round a quadruple straight line spiral, instead of four T-shaped figures. This pattern is taken from a plate of inlaid metal-work from Moradabad, in India, and now in the Indus-

<sup>1</sup> At Carew and Nevern, in Pembrokeshire; at Golden Grove, Carmarthenshire; and Llantwit Major, Glamorganshire.—Westwood's *Lapidarium Walliæ*.

trial Museum at Edinburgh. It is curious that an almost identical design occurs upon one of the crosses at Kells, county Meath.<sup>1</sup>

Fig. 64 is founded on squares set parallel (fig. A, Plate 1), and filled in with quadruple straight line spirals (fig. f, Plate 3), all the spirals having the same direction of twist. Every alternate square is left blank. This pattern is from a Roman pavement found at Wellow, near Bath,<sup>2</sup> and is given for the sake of comparison.



Figs. 66 to 71. Key Patterns within Circles.

Fig. 65 is the same as the preceding, except that all the squares are filled in instead of only every other one. This pattern is from a Roman pavement found at Newton St Loe, near Bath.<sup>3</sup>

Figs. 66 to 71 show the various methods of covering circular spaces with key patterns. The patterns are generally formed by dividing the

<sup>1</sup> O'Neill's *Irish Crosses*, plate xxix.

<sup>2</sup> Lyson's *Magna Britannia*.

<sup>3</sup> J. B. Waring's *Ceramic Art*, plate 42.



circle into three-sided and four-sided spaces by radial lines and concentric circles, and filling them in the same way as triangles and squares. Circles containing key patterns occur occasionally in Celtic MSS., such as the Book of Kells and the Gospels of MacDurnan, but, are unknown on sculptured stones, except on grave slabs in Ireland, and two stones near St David's, in Pembrokeshire, one of which bears the Irish name Gurnmarc.<sup>1</sup> The resemblance between the labyrinths of the Middle Ages and some forms of key patterns has already been pointed out. The pattern which most nearly corresponds with the design of the labyrinths is that shown on fig. 67.<sup>2</sup> Key patterns contained in circles are common in Chinese ornament, and an example is given on fig. 70 for the sake of comparison.

Fig. 66 is a circle divided into eight equal three-sided spaces by radial lines, each of which is filled in with double straight line spirals (fig. b, Plate 3).

Fig. 67 is a circle divided into eight equal segments by radial lines, as in the preceding case, but the key pattern formed by portions of concentric circles branching out at right angles from the radial lines.

Fig. 68 is a circle divided into four equal segments by radial lines, the rest of the pattern being formed by four circular arcs and crosses.

Fig. 69 is a circle enclosing an equilateral triangle, the rest of the space being divided symmetrically by six radial lines, and sets of zigzag lines.

Fig. 70 is a circle divided into four equal spaces by radial lines, and filled in with key patterns.

Fig. 71 is a circle divided into eight equal segments, each of which is again divided by a concentric circle into a four-sided and a three-sided space, the former being filled in with a double straight line spiral (fig. b, Plate 2), and the latter with fig. b, Plate 3.

<sup>1</sup> Westwood's *Lapidarium Walliæ*, plate 60.

<sup>2</sup> Compare with labyrinth sculptured on one of the porch piers of Lucca Cathedral see *Assoc. Architect. Soc. Rep.*, vol. iv. p. 257; and *Jour. Brit. Archaeolog. Inst.*, vol. xv. p. 218.

## SPIRAL PATTERNS.

There are, broadly speaking, two distinct forms of spiral patterns used in Celtic art—(1) where the band of which the spiral is formed gradually expands into a trumpet-shaped end; (2) where the band of which the spiral is formed remains the same breadth throughout its whole length. The first of these forms is the earlier of the two, and is copied directly from the metal-work of pagan times. The expanding spirals are so arranged as to leave three-sided spaces (bounded by the various curves), which form the groundwork, and are ornamented with small circles, triangles, and almond-shaped figures, left white on a coloured or black ground. The spirals are not all of equal size and their centres are not generally arranged symmetrically (see fig. 85).

In the case of the second form of spiral-work, which is composed of bands of unvarying width, and is later, there is only left a plain black ground. This class of spiral-work is shown on figs. 80 to 82, and as has been already explained there is a corresponding key pattern to each, the spirals being composed of straight lines making bends at right angles, instead of being curved. The centres of the spirals are all placed symmetrically at the corners of squares, and the space occupied by each spiral is the same size.

Looked upon mathematically, a spiral is that curve which would be traced by a point continually moving along the radius of a circle whilst the radius was rotating.

There are various kinds of spirals known to mathematicians, but perhaps the simplest is that drawn by means of a pencil, a cylinder, and a piece of string. The pencil is tied to the end of the string, which is wound round the cylinder. The cylinder is placed upright upon a sheet of paper, and the curve traced by unwinding the string, taking care to keep it tight the whole time.

In Celtic art the spirals are generally composed of several bands diverging from one point: thus there are single spirals (fig. A, Plate 6), double spirals (fig. F, Plate 6), triple spirals (fig. O, Plate 6), quadruple spirals (fig. T, Plate 6), and so on. Each kind of spiral can have a different direction of twist, or in other words, can be right or left handed.

There are different ways of coiling the band forming the spiral; if the bands are near together it is close coiled, and if far apart loose coiled. A spiral may either start from a central point, or there may be a circle in the middle. The various methods of ornamenting the centres of spirals are shown on Plate 6, figs. A to U, and also in figs. 88 and 89; in the latter case the central circle from which the spiral starts is ornamented with a large number of other spirals. Sometimes the

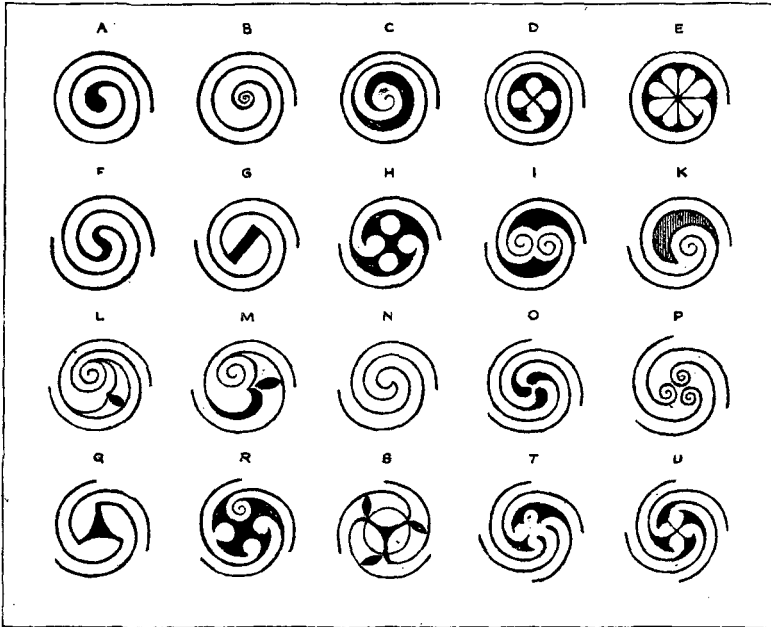


Plate 6. Methods of Ornamenting Centres of Spirals.

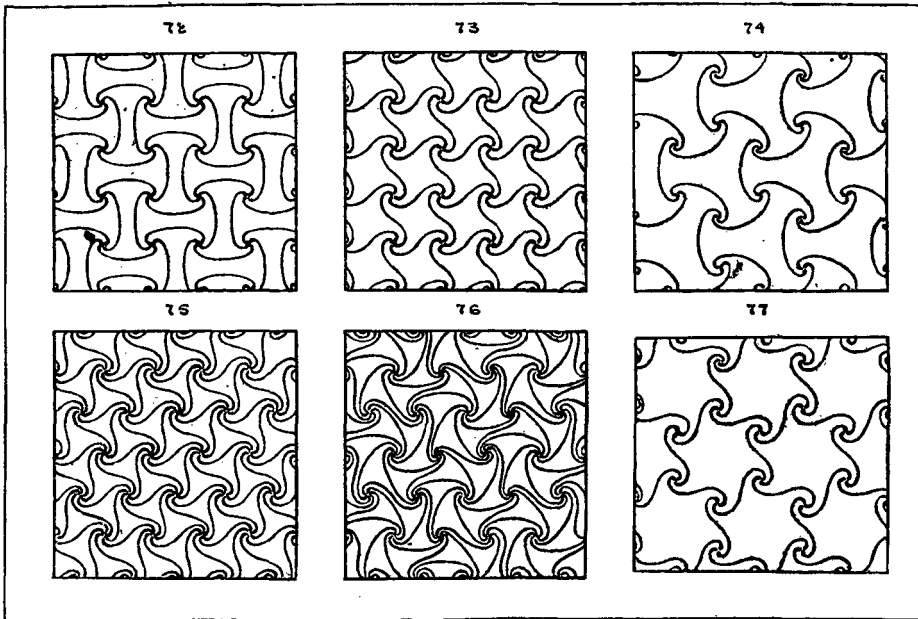
centres of the spirals are formed of bird's heads,<sup>1</sup> or figures of men with interlaced limbs.<sup>2</sup> When the centre of a spiral is not highly ornamented it generally starts from a pear-shaped black spot. It is close coiled at

<sup>1</sup> On Stones at St Vigean and Birnie (Stuart, vol. i. pls. 42 and 70), and in the Book of Kells (*Palæog. Soc. Publ.*, pl. 55).

<sup>2</sup> In the Book of Kells (*Palæog. Soc. Publ.*, pl. 89).

the beginning, after which the bands get further apart, and then round the edge there are generally a few coils very close indeed; finally, the band diverges at a tangent. After divergence the band expands in width, having a trumpet-shaped end, which joins on to the trumpet-shaped end of the next, leaving a black almond-shaped space between the two.

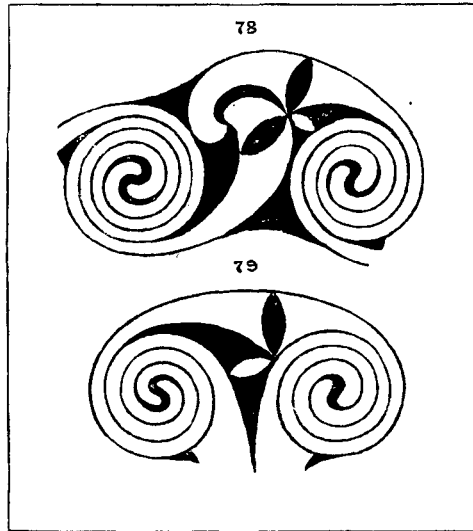
The variations in this class of spiral-work are made—(1) by altering



Figs. 72 to 77. Methods of arranging and connecting Spirals.

the number of bands of which the spiral is composed, making it single, double, triple, or quadruple; (2) by making the spiral right or left handed; (3) by the methods of coiling the spiral closely or loosely at different parts of the curve; (4) by having ornamental centres; (5) by the ways of arranging the centres of the spirals relatively to each other; (6) by the ways of connecting the spirals together so as to form one design; (7) by the different ornamental backgrounds.

Figs. 72 to 77 show the symmetrical ways of arranging the centres of spirals relatively to each other, and of connecting them together. The symmetrical ways of arranging the centres of spirals are founded on the fact previously mentioned that squares, equilateral triangles, and hexagons are the only regular plane figures which will entirely cover a surface, in whatever position the figures are placed, so that their corners meet round a point and their sides touch. There are only two ways of



Figs. 78, 79. Methods of connecting two Spirals.

connecting together two adjacent spirals. If the two spirals have an opposite direction of twist, the curve is C-shaped ; but if they have the same direction of curve, it is S-shaped.

Fig. 72 has the centres of the spirals arranged on the square system, and connected by C-shaped curves, the twists of the spirals being alternately right and left-handed.

Fig. 73 has the centres of the spirals arranged upon the square system, and connected by S-shaped curves, all the spirals having the same direction of twist.

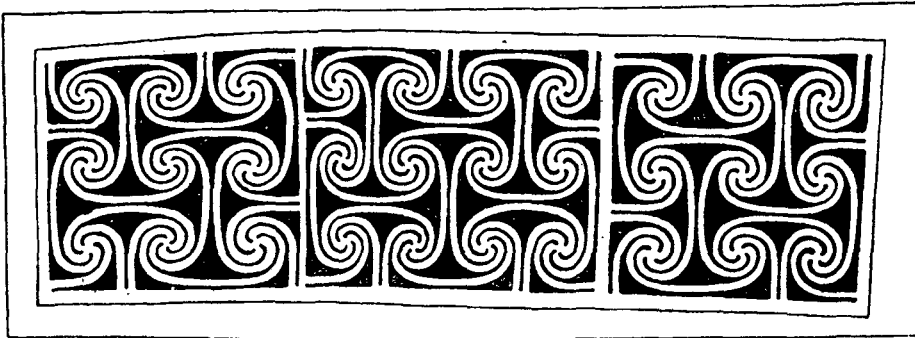
Fig. 74 has the centres of the spirals arranged upon the hexagonal system, and connected by **C**-shaped curves.

Fig. 77 has the centres of the spirals arranged upon the hexagonal system, and connected by **S**-shaped curves.

Fig. 75 has the centres of the spirals arranged upon the triangular system, and connected by **S**-shaped curves.<sup>1</sup>

Fig. 76 has the centres of the spirals arranged upon the triangular system, and connected by **C**- and **S**-shaped curves alternately.

Plate 6 (figs. A to U) shows the various ornamental forms of centres

80<sup>A</sup>

Spiral Pattern on the Font at Deerburch, Gloucestershire.

for spirals. A to E are single spirals; F to N are double spirals; O to S are triple spirals; and T and U are quadruple spirals.

Figs. 78 and 79 show the methods of connecting the expanded ends of the first system of spirals. **S**-shaped connecting curves are avoided almost entirely in Celtic spiral-work, either by introducing a fresh spiral (generally a smaller one, and forming part of the background) between the two to be joined, or by the curious hook-shaped termination shown on fig. 78. Sometimes three spirals are connected in this way (see fig. 85), the third band hooking over the other two, and

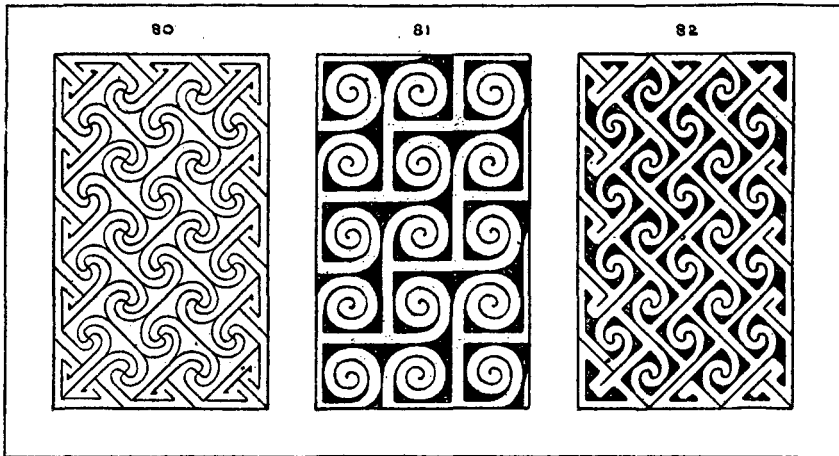
<sup>1</sup> A gold plate with a spiral pattern formed on this system is given in Schliemann's *Mycenæ*, p. 311.

in fact forming a kind of incipient spiral. On fig. 90 there will be seen an instance of an S-shaped connection.

Fig. 78 gives the method of connecting two spirals whose directions of twist are the same.

Fig. 79 gives the method of connecting two spirals whose directions of twist are opposite.

Figs. 80 to 82 show the second or later class of spiral-work arranged so as to cover a surface. All the bands are here of equal width, and there is no ornamental background.



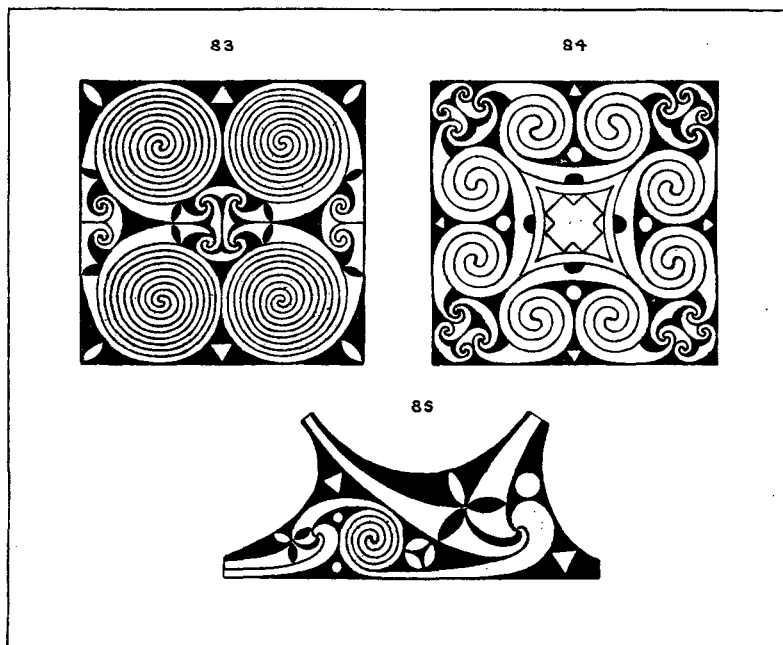
Figs. 80 to 82. Spiral Patterns founded on Squares.

Fig. 80 has the centres of the spirals arranged at the corners of squares placed diagonally (fig. B, Plate 1), and connected by C-shaped curves, as shown on fig. 72. The spirals are composed of four bands.

Fig. 80A is founded on squares set parallel (fig. A, Plate 1), the spirals being quadruple and joined by C-shaped curves (fig. 72). The drawings show 3 out of 8 panels surrounding the font at Deerhurst, in Gloucestershire.

Fig. 81 is founded on squares set parallel (fig. A, pl. 1), and the

spirals branch out on each side of lines running in a zigzag direction diagonally across the paper. The spirals are composed of a single band. The pattern is formed exactly upon the same principle as the key pattern (fig. 14), except that in one case the spirals are composed of curved lines and in the other of straight lines.



Figs. 83 to 85. Squares filled in with Spiral-Work.

Fig. 82 is formed like the preceding, only with spirals of two bands instead of only one.

Figs. 83 and 84 show the methods of filling in squares with the first or earlier class of spiral-work. The centres are all arranged symmetrically upon the square system, and joined by C-shaped curves. Variety is effected by making some of the spirals large, with a great number of coils of fine lines, and others small, with only a few coils.

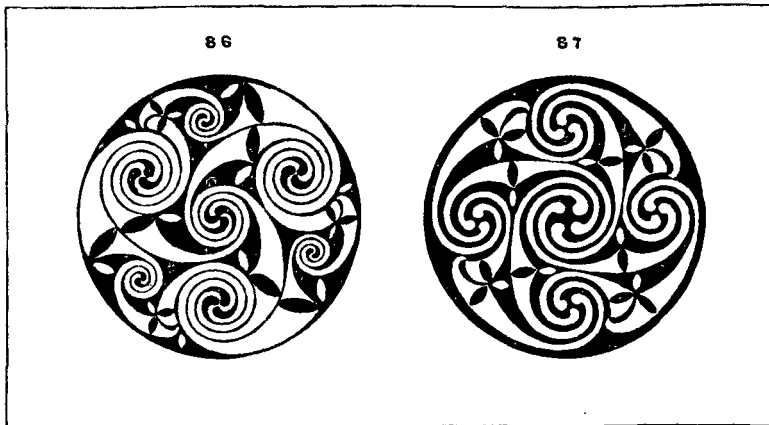


The triangular spaces of the background are ornamented with white circular, triangular, and almond-shaped figures.

Fig. 85 shows the method of ornamenting the spaces left between the spirals.

Figs. 86 and 87 show the methods of filling in circles with the first class of spiral-work.

Fig. 86 has a central spiral connected by C-shaped curves with three others arranged symmetrically round it. The remaining spaces



Figs. 86, 87. Circles filled in with Spiral-Work.

are filled in with 3 smaller spirals connected to the 3 large ones by an S-shaped curve, and the hook-shaped form shown on fig. 78.

Fig. 87 has a central spiral connected by C-shaped curves, with four others arranged symmetrically round it, the four outer circles being connected together by the hook-shaped form shown on fig. 78.

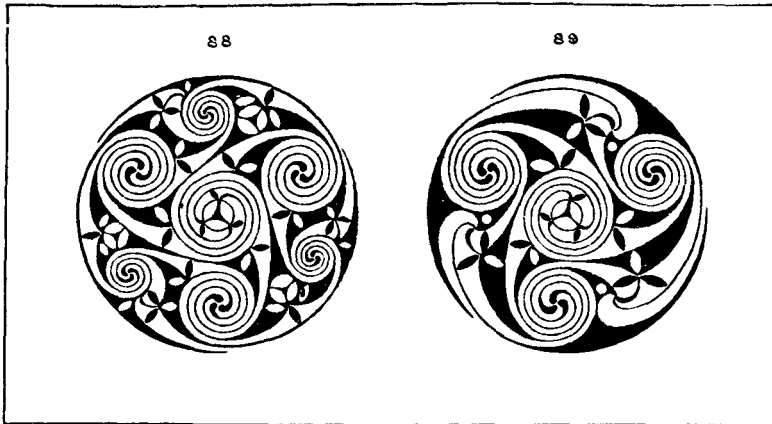
Figs. 88 and 89 show the large ornamental circular centres for spirals. The circles are filled in like those on the two preceding figures except that the bands of the spiral of which it forms the centre run into the inside of the circle, and are there connected with some of the other spirals. These examples are from the Book of Durrow,<sup>1</sup> and other very

<sup>1</sup> Westwood's *Miniatures*, pl. 7; also copied into Stuart's *Sc. Stones*, vol. ii.

elaborate specimens may be found in the Book of Kells<sup>1</sup> in the Lindisfarne Gospels,<sup>2</sup> in the Irish Gospels at Paris, and on the Tara Brooch.

Fig. 88 is the ornamental centre of a triple spiral, composed of three large and three small spirals arranged symmetrically round a central one. The three small outer spirals are connected with the one of which this is the ornamental centre by a hook-shaped form, as shown on fig. 78. All the other connections are C-shaped.

Fig. 89 is the same as the preceding, except that the three small outer spirals are omitted.



Figs. 88, 89. Ornamented Centres of Spirals.

Fig. 90 is from the "Quoniam quidem" Initial page in the Book of Durrow,<sup>3</sup> and is given as an example of spiral-work filled into an irregular space. The centres of the spirals are disposed irregularly, and connected by S, C, and hook-shaped curves. The background is ornamented in the usual way. Spiral-work is especially adapted to fitting into irregular spaces, as the size of the spirals may be altered at pleasure.

<sup>1</sup> *Palæog. Soc. Publ.*, pls. 55 and 58.

<sup>2</sup> *Palæog. Soc. Publ.*, pls. 4, 5, 6, and 22.

<sup>3</sup> Westwood's *Miniatures*, pl. 6.

It is also well suited to the forms of curved letters, such as the Q, which begins the Gospel of St Luke in Latin.

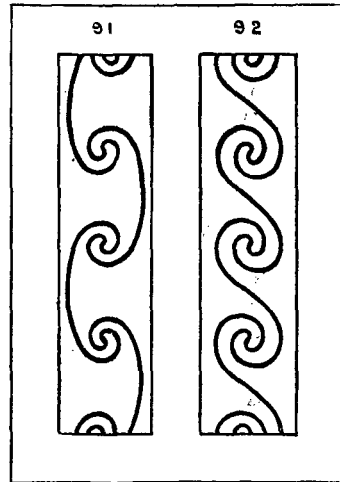
Fig. 91 is a border pattern composed of right and left handed double spirals alternately connected by C-shaped curves.

Fig. 92 is a border pattern composed of double spirals of the same direction of twist connected by S-shaped curves.

Fig. 93 is one half of the semicircular border round the miniature of David, in the so-called Psalter of St Augustine (Brit. Mus. Vesp., A. i.).



Fig. 90. Initial Letter in the Book of Durrow.



Figs. 91, 92. Spiral Border Patterns.

Fig. 94 (see p. 308) is a design by the Author of this paper founded on the method of arranging and connecting spirals, as shown in fig. 76.

#### LOCALITIES WHERE THE DIFFERENT ORNAMENTS OCCUR.

*Note.*—The Scottish Stones will be found engraved either in Stuart's *Sculptured Stones of Scotland* or in the *Proc. Soc. Ant. Scot.*; the Irish Stones in O'Neill's *Crosses of Ireland* and Petrie's *Inscriptions in the*

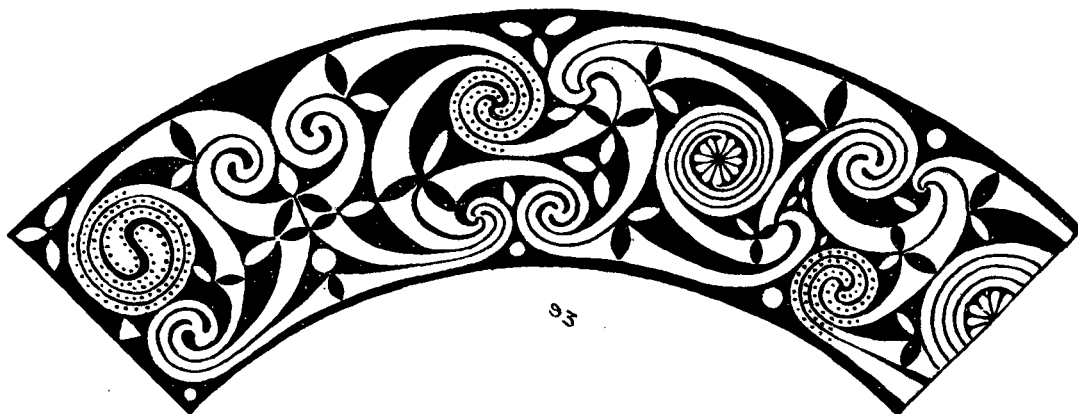


Fig. 93. Half of a Semicircular Border, Psalter of St Augustine.

*Irish Language*; the Welsh Stones in Westwood's *Lapidarium Walliæ*; the Isle of Man Stones in Cumming's *Runic Remains of the Isle of Man*. Some of the English examples are engraved in Stuart's *Sculptured Stones*, others will be found in Lyson's *Magna Britannia* and the Journals of the various Archæological Societies, but, as yet, no complete collection has been made. The Celtic MSS. will be found illustrated in Professor Westwood's *Palæographia Pictoria Sacra*, and his *Miniatures*; in the Publications of the Palæographical Society; in the National Irish MSS. published by the Government; and in the works of Count Bastard, Sylvestre, Noel Humphreys, Shaw, Astle, &c.

Fig. 1.—Kells, co. Meath.

Fig. 2.—Benvie, Forfarshire; Drainie, Morayshire; Nerern, Pembrokeshire.

Fig. 3.—Instances of the occurrence of this variety of the key pattern in Celtic art are not yet known.

Fig. 4.—Crail, Fifeshire; Monasterboice (S.E. cross), co. Louth; Kells, co. Meath.

Fig. 5.—Instances of the occurrence of this variety of the key pattern in Celtic art are still unknown.

Fig. 6.—Farnell, Invergowrie, and Benvie, Forfarshire; St Andrews, Fifeshire; Kilkerran, Argyllshire; Liberton, Edinburghshire; Drainie, Morayshire; Warkworth, Northumberland; Billingham, Durham; Pen Arthur, Pembrokeshire.

Fig. 7.—Examples of the occurrence of this variety of the key pattern in Celtic art are not yet known.

Fig. 8.—Kilkerran, Argyllshire; Clonmacnois (Sechnasach grave-slab, A.D. 931) King's co.; Llangaffo, Anglesey; Golden Grove, Carmarthenshire; Carew and Llanwnda, Pembrokeshire. A double border key pattern of this type occurs on the Maen Achwynfan, Flintshire; and at Penmon, Anglesey.

Fig. 9.—MS. Brit. Mus. Harl., 2788, fol. 3, Penmon, Anglesey.

Fig. 10.—MS. Brit. Mus. Harl. 2788, fol. 3.

All the foregoing are border patterns, but surface patterns belonging to the same class occur in the following localities:—Dunfallandy, Perth-

shire ; Crail, Fifeshire ; Eassie, Forfarshire ; Abbotsford, Roxburghshire ; Rossie Priory, Forfarshire ; Rosemarkie, Ross-shire ; Farr, Sutherland. MS. St Gall Gospels.

Fig. 11.—MS. St Gall Gospels, “ $\chi\rho\iota$  autem generatio,” initial page (Westwood’s *Miniatures*, pl. 26).

Fig. 12.—MS. St Gall Gospels.

Fig. 13.—MS. Book of Durrow (Westwood’s *Miniatures*, pl. 13).

Fig. 14.—Maiden Stone, Chapel of the Garioch, Aberdeenshire ; Nigg, Ross-shire ; Golspie and Farr, Sutherlandshire ; Kirriemuir, Kingoldrum, St Vigeans, Inchbrayock, Aberlemno, and Monifieth, Forfarshire ; Mugdrum, St Andrews, Fifeshire ; St Madoes, Fowlis Wester, Meigle, and Dunkeld, Perthshire ; Eilanmore, Argyllshire ; Rosemarkie, Ross-shire ; Abercorn, Linlithgowshire ; Canna, I. of Skye ; Silian, Cardiganshire ; Killamery, co. Kilkenny ; Monasterboice (W. Cross), co. Louth ; Kells, co. Meath ; MSS. Lindisfarne Gospels (*Palæog. Soc.*, pl. 5).

Similar patterns but with the straight line spirals drawn with very fine lines close together, making a great many turns, occur in the Book of Durrow (Westwood’s *Miniatures*, pl. 5), in the Gospels of Mac Durnan (*idem*, pl. 22) and in the Book of Kells (*Palæog. Soc.*, pls. 58 and 89).

Fig. 15.—MS. Lindisfarne Gospels (Westwood’s *Miniatures*, pl. 12).

Fig. 18.—MS. Gospels of Mac Durnan (Four Evangelists, Miniature).

Fig. 19.—Tynan Abbey, co. Armagh ; Monasterboice (S.E. Cross), and Termonfechin, co. Louth. MS. Gospels of Mac Durnan (Miniature of St John and initial pages of St Mark’s and St Luke’s Gospels).

Fig. 20.—MS. St Gall Gospels (Miniature of Crucifixion).

Fig. 21.—MSS. Psalter of St John’s College, Cambridge (Miniature of David and Goliath) ; St Gall Gospels (Westwood’s *Miniatures*, pls. 26, 27, and 30).

Fig. 22.—Norham, Northumberland.

Fig. 23.—Meigle, Perthshire ; Farnell.

Fig. 24.—Kells, co. Meath.

Fig. 25.—MS. Brit. Mus. Harl. 2788, fol. 50.

Fig. 29.—Rosemarkie, Ross-shire.

Fig. 32.—St Andrews.

Fig. 33.—Metal-work—The casket known as the “*Domnach Afrigid*.”

Double border key patterns of a similar kind occur in the Irish Psalter, Brit. Mus. Vit. F. xi. fol. 1 and 15.

Fig. 34.—Clonmacnois, King's co.; MSS. Brit. Mus. Psalter Vesp. A. i. fol. 30; Bœda Tib. C. ii.; Codex Aureus, Harl. 2788.

Fig. 35.—MS. Brit. Mus. Biblia Gregoriana Bibl. Reg. I.E. vi.

Fig. 38.—Rosemarkie, Ross-shire. MSS. St Gall Gospels (Miniature of Christ in Glory), St Chad's Gospels (Westwood's *Miniatures*, pls. 22 and 23), Book of Kells (*Palæog. Soc.*, pl. 55).

Fig. 39.—Inchcolm; Gattonside, near Melrose; Clonmacnois, King's co.; Penally, Pembroke-shire; Bronze plate with Crucifixion, in the Museum of the Royal Irish Academy (Stuart's *Sculptured Stones*, vol. ii. pl. 10); Ivory diptych in the Church of St Genoels, Elderen, Limburg (Westwood's *Miniatures*, pl. 52); Brit. Mus. MS. Irish Psalter, Vit. F. xi. fol. 38.

Fig. 42.—Shandwick, Ross-shire; Farr, Sutherlandshire; Meigle, Perthshire; St Andrews, Fifeshire; Rosemarkie, Ross-shire. MSS. Lindisfarne Gospels (*Palæog. Soc.*, pls. 4 and 5); Gospels of Mac Durnan (Westwood's *Miniatures*, pl. 22); Book of Kells (*idem*, pl. 11); St Chad's Gospels (*Palæog. Soc.*, pl. 35).

Fig. 43.—Gospels of Mac Regol (Westwood's *Miniatures*, pl. 16).

Fig. 46.—Nigg, Ross-shire; Invergowrie, Forfarshire; Llantwit Major, Glamorganshire; Llangevelach, Brecknockshire; MS. Book of Kells (Westwood's *Miniatures*, pl. 9).

Fig. 47.—MS. Book of Kells (Westwood's *Miniatures*, pl. 11).

Fig. 48.—Keils in Knapdale, Argyllshire; MS. Gospels of Mac Durnan (initial page of St Matthew's Gospel); Book of Kells (*Palæog. Soc. Publ.*, pl. 58).

Fig. 49.—Lindisfarne, Durham; Drainie, Elginshire; Coychurch, Glamorganshire; MS. St Chad's Gospels (Westwood's *Miniatures*, pl. 23, *Palæog. Publ.*, pl. 21).

Fig. 50.—The same as fig. 48.

Fig. 51.—MS. Gospels of Mac Durnan (Miniatures of Four Evangelists, St Matthew and St Luke).

Fig. 52.—MS. St Gall Penitential (Westwood's *Miniatures*, pl. 28).

Fig. 53.—Dupplin Castle, Perthshire; Invergowrie, Forfarshire; St Andrews, Fifeshire; Monifieth, Forfarshire; Lindisfarne, Durham.

- Fig. 54.—MS. Gospels of Mac Durnan (Westwood's *Miniatures*, pl. 22).
- Fig. 55.—MS. St Gall Penitential (Westwood's *Miniatures*, pl. 28).
- Fig. 56.—MS. Gospels of Mac Durnan (Miniature of St Matthew).
- Fig. 57.—Alnmouth, Northumberland; Lindisfarne, Durham.
- Fig. 58.—Invergowrie, Forfarshire; St Andrews, Fifeshire; Llangevelach, Llantwit Major, Glamorganshire; Tuam, co. Galway; Termonfechin, co. Louth; Winwick, Lancashire.
- Fig. 59.—Abercromby, Fifeshire; Millport, Buteshire.
- Fig. 60.—St Andrews, Fifeshire; Barrochan, Renfrewshire; Margam Abbey, Glamorganshire; Merthyr Mawr, Carew, and Nevern, Pembrokehire; Golden Grove, Carmarthenshire; Clonmacnois S. Cross, co.
- Fig. 61.—Norham, Northumberland; Caven and Nevern, Pembrokehire; Golden Grove, Carmarthenshire; Llantwit Major, Glamorganshire; MS. Book of Durrow (Westwood's *Miniatures*, pl. 7); last page of Gospels of MacRegol.
- Fig. 62.—Glencar, co. Kerry; MS. Lindisfarne Gospels (*Palæog. Soc. Publ.*, pl. 5); Cologne Penitential (Westwood's unpublished tracings).
- Fig. 63.—Inlaid metal-work plate from Moradabad, India (Industrial Museum, Edinburgh). Very similar patterns also on cross at Kells (O'Neill, pl. 29), and MS. Gospels of Mac Durnan.
- Fig. 64.—Roman pavement found at Wellow, near Bath.
- Fig. 65.—Roman pavement found at St Loe, near Bath.
- Fig. 66.—MS. Gospels of Mac Durnan (Initial page of St Luke's Gospel).
- Fig. 67.—MS. Book of Kells (Westwood's *Miniatures*, pl. 10).
- Fig. 68.—MS. Book of Durrow (Westwood's *Miniatures*, pl. 7).
- Fig. 69.—On metal-work; the Tara Brooch in the Museum of the Royal Irish Academy.
- Fig. 70.—On a Chinese teapot.
- Fig. 71.—Pen Arthur, near St Davids, Pembrokehire.
- Plate 6, figs. D, E, F, O, P, R, T, and U.—MS. Stockholm Gospels (Westwood's *Miniatures*, pl. 2).
- Figs. C, I, K, L, M, N, and S.—MS. Book of Durrow (Westwood's *Miniatures*, pls. 6 and 7).
- Figs. G and Q.—MS. St Gall Gospels (Westwood's *Miniatures*, pl. 26).
- Figs. 78 and 79.—MS. Lindisfarne Gospels.



- Fig. 80.—Rosemarkie, Ross-shire ; Bradford-on-Avon, Wiltshire.  
 Fig. 80A.—Deerhurst, Gloucestershire.  
 Fig. 81.—Meikle, Perthshire.  
 Fig. 82.—Lemanaghan, King's co. (Rev. James Graves's "Church, and Shrine of St Manchan") ; Drainie, Elgin.  
 Fig. 83.—MS. Book of Kells (Westwood's *Miniatures*, pl. 9).  
 Fig. 84.—MS. Book of Kells (Westwood's *Miniatures*, pl. 10).  
 Fig. 85.—MS. Book of Durrow (Westwood's *Miniatures*, pl. 7).  
 Fig. 86.—MS. St Gall Gospels (*Miniature of St John*).  
 Fig. 87.—MS. Stockholm Gospels (Westwood's *Miniatures*, pl. 52).  
 Figs. 88 and 89.—MS. Book of Durrow (Westwood's *Miniatures*, pl. 7).  
 Fig. 90.—MS. Book of Durrow ("Quoniam quidem" initial page).  
 Fig. 91.—Dunfallandy, Perthshire ; Abbotsford, Roxburghshire.  
 Fig. 92.—Golspie, Sutherlandshire ; Strathmartin, Forfarshire ; Abercrombie, Fifeshire.  
 Fig. 93.—Psalter Brit. Mus. Vesp. A1, fol. 30 (*Miniature of David*).

