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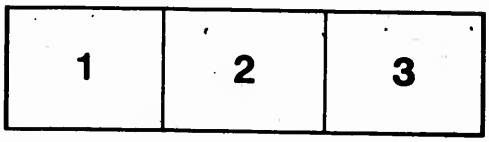

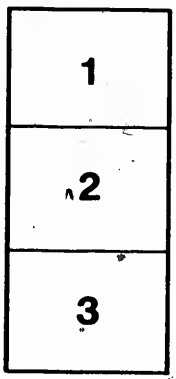

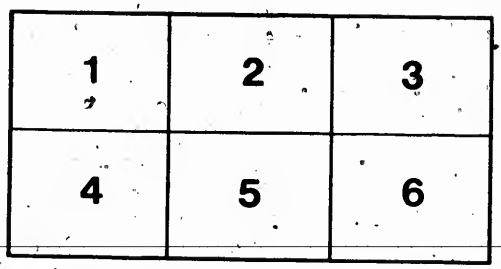

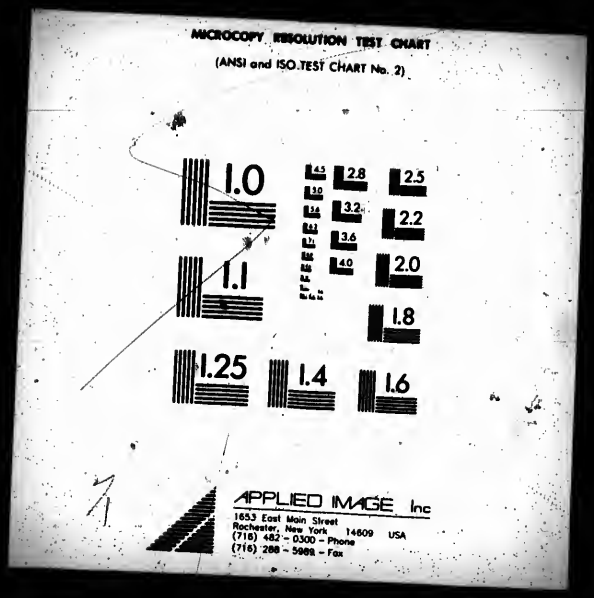
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HINTS TO THE TEACHER.

In Book V. more advanced work is taken up than in Book IV. Pupils should try other mediums of expression than the pencil if they have not done so previously. Pen and ink is a medium that is easily learned after using a pencil. A common pen, India ink in the liquid form and paper upon which the ink will not run are all that is necessary. Sketch with a pencil the first outline as for a pencil drawing—use the pen to line-in the drawing, shade by lines drawn slowly and with a purpose. The pen is held in about the same manner as the pencil. The brush may be used for washing in borders and ornamental forms, such as are shown on page 9. Try the effect of washing in the pattern, leaving the field white and again washing in the field, leaving the pattern white. The brush is held in a vertical position and the point pressed down to give the desired strength of line then moved slowly and deliberately in the direction the line is to be drawn.

Geometrical drawing is continued. Many problems arising out of the types shown may be worked by the pupils at the suggestion of the teacher. Under Prob. 1, p. 10, a square, a regular hexagon, heptagon, octagon or nonagon may be described on the given line. Prob. 4 should be done practically by the pupils. If the pupils wish to purchase a drawing pen, they may draw the problems in ink.

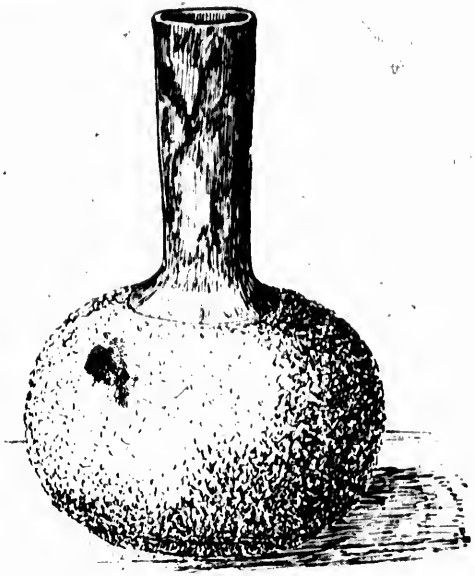
The original drawing of the face on p. 6, by Mr. O. P. Staples, O. S. A., was drawn over three times as large as the figure shown. Pupils may try to draw the head of some friend, or they may try to draw a head from a photograph, indicating the shades by pen and ink. The direction of the shade lines is largely determined by the direction of the surface. The proper tone of shade is obtained by varying the weight of the lines or the distance between them.

A working drawing of a table is shown on p. 20. Notice how the dimensions are shown. One dash indicates feet and two indicate inches, thus 4′ 2″ is four feet two inches. Drawing the small and capital letters and figures is a very valuable exercise in training the observation and power of execution. All working drawings should be neatly lettered and all explanations neatly printed.

Examples of Moorish or Saracenic ornament are shown on p. 9. The large bisymmetrical figure is from the wall decoration of the Alhambra. Some explanation of the history of the Moors should accompany the study of these figures.

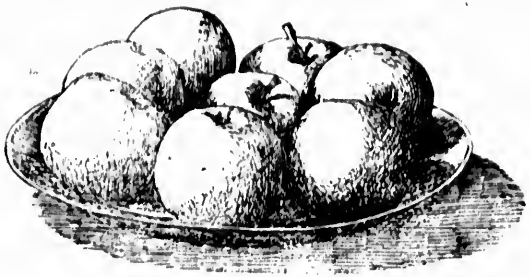
The examples of Early Christian and Gothic ornament on the third page of the cover may be compared with the Greek and Roman styles and with the styles of the present day. Every Anglican church is an example of the Gothic style. The pointed arch and the use of geometric tracery in the window spacing are characteristic of the Gothic.

The author desires to thank Mr. O. P. Staples, O.S.A., for the drawing on p. 6; Mr. J. W. Milne for those on pp. 3, 4, and 24; and Mr. R. W. Magee for those on pp. 14 and 22.

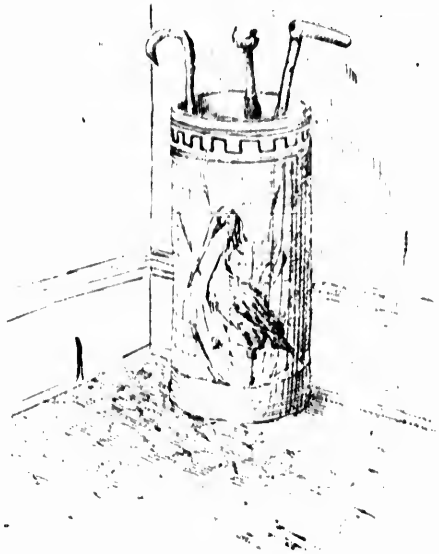


1

Draw a vase with a spher[illegible] base.
Draw a lamp.
Draw a rose bowl.



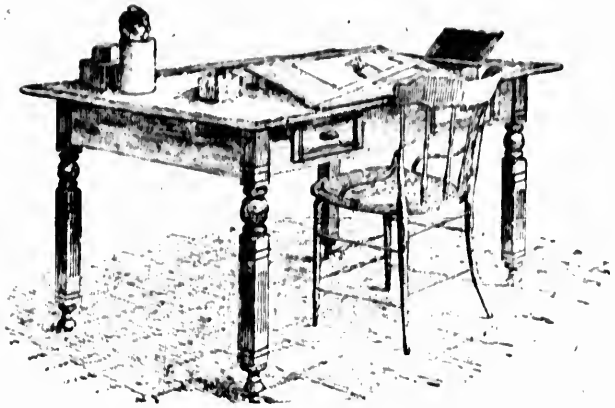
Place several apples on a plate and draw the group.
Draw a plate of plums or pears.
Arrange various fruits on a fruit dish and draw the group



Draw an umbrella stand

Draw an umbrella, closed, leaning against the wall

Draw an umbrella opened, resting on the table

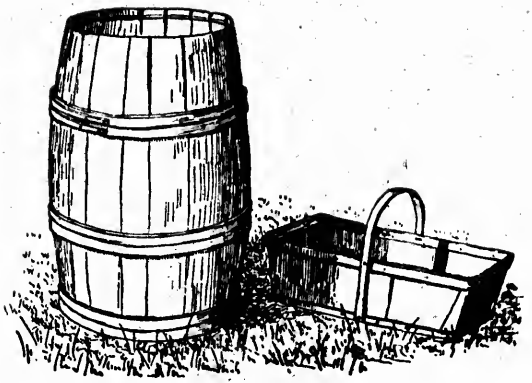


Draw a table and chair placed differently from those shown here.

Use the next page for optional drawings

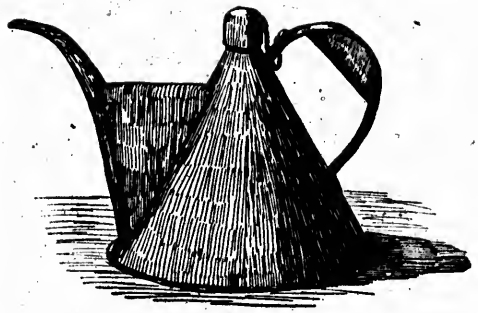
Draw at home the head of some member of your family. Draw the same head from different points of view.

Draw a hand from various points of view.

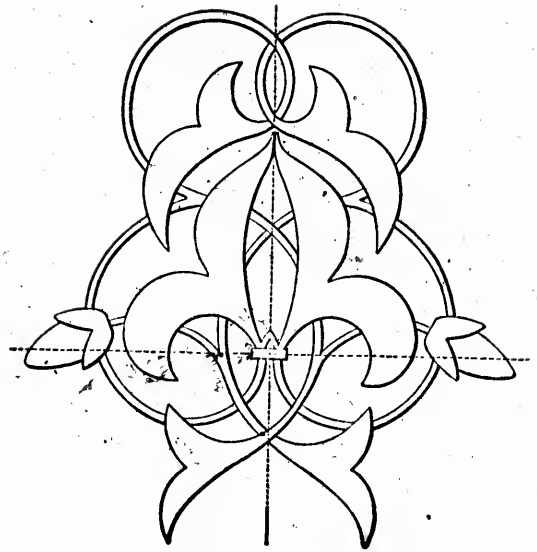


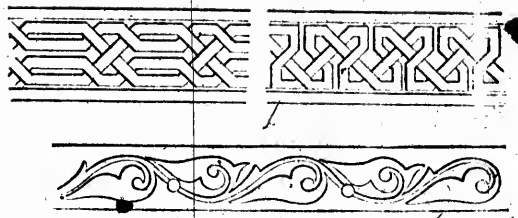
7

- Draw a barrel and basket in various positions.
  Draw a barrel and pail.



Draw some objects like a cone, such as an ink can or coal oil can. Select objects making a suitable group and draw them.

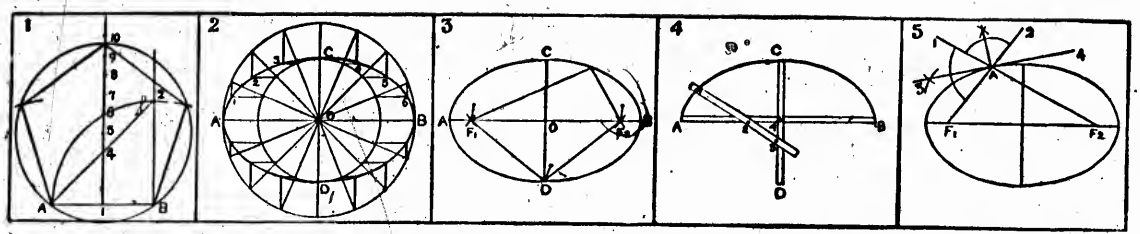




These are examples of Saracenic ornament as used by the Moors when they controlled part of what is now Spain.

These may be used as examples for copying and enlarging.

Compare the scroll with others you have seen.



PROB. 1.—*To describe any regular polygon, in this case a pentagon, on a given line, A B,* (general method).

Bisect A B at 1, and erect a perpendicular 1 10. At B erect a perpendicular B 2 equal to A B. Join A 2. With B as a centre and distance B A describe a quadrant A 6 2.

If a circle be described with 4 as a centre and a distance 4 A, the circle will enclose a square whose sides are equal to A B. Similarly if 6 be taken as a centre the circle will enclose a regular hexagon whose sides are equal to A B. Bisect 6 4 at 5. With 5 as a centre and distance 5 A, draw a circle. Set off A B around the circle. Similarly if equal distances 4 5 be set off above 6 as 6 7, 7 8, 8 9, 9 10, then these points will be the centres of circles enclosing regular polygons of 7, 8, 9, 10 sides.

PROB. 2.—*To describe an ellipse when the transverse (major) axis A B and the conjugate (minor) axis C D are given.*

Place the axes bisecting each other at right angles at O, with O as a centre and distances O A and O C, describe circles. Divide each quarter of the circumferences into any number of equal parts, say 4, by radii. From the points of division on the larger circumference draw lines parallel to the minor axis, and from those on the smaller draw lines parallel to the major axis, meeting at points 1, 2, 3, 4, 5, 6. Through these points and the ends of the axes draw a curve as shown. This will be an ellipse.

PROB. 3.—*To describe an ellipse by means of a string and pins.*

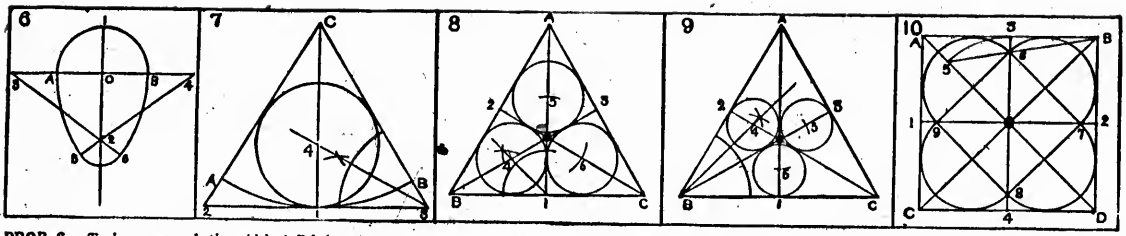
Place the axes as in the last problem. With C at a distance equal to A O, draw arcs, cutting A B in F 1 and F 2. These points are foci of the ellipse. Place a pin at F 1, another at F 2, another at D. Tie a string enclosing the three pins. Remove the pin at D and put a pencil in its place. Move the pencil around keeping the string taut and the curve will be the circumference of an ellipse. NOTE.—This method is employed by gardeners for shaping flower beds.

PROB. 4.—*To describe an ellipse by means of a straight stick, when the axes are given.*

Near the end of the stick make a hole to hold a pencil or scratch awl as at 1. Measure 1 2, equal to half the minor axis, and 1 3, equal to half the major axis. Fasten together two pieces of wood A B and C D. Place the angle 4 at the middle of the long axis. Through 2 and 3 drive nails. By keeping 2 against the edge on the long axis and 3 against the edge on the short axis the pencil at 1 will describe a quadrant of an ellipse. The other half may be described in a similar way. NOTE.—This method is used by carpenters to describe the shape of the top of elliptical arches.

PROB. 5.—*To draw a tangent to an ellipse and a line perpendicular to the curve of an ellipse at a given point. A, the axis and foci being given.*

Join A to the foci and produce the lines beyond the point, as A 1 and A 2. The line bisecting the angle F, A 1 is a tangent to the ellipse at A. The line bisecting the angle 1 A 2 is perpendicular to the ellipse. NOTE.—The perpendicular is useful in finding the shape of stones composing an elliptical arch.



PROB. 6.—*To draw an oval, the width A B being given.*

On A B describe a semicircle. Produce A B both ways to 3 and 4, making A 3 and B 4 equal to the radius of the semicircle. Through O, the centre of A B, draw a line at right angles to A B. Select a point 2 in this line. Join 3 2 and 4 2 and produce them. With 3 and 4 as centres and 3 B as a radius, draw arcs, meeting the lines produced in 5 and 6, with 2 as a centre, draw the arc 5 6.

PROB. 7.—*To inscribe a circle in a sector of a circle C A B.*

Bisect the arc A B at 1. Join C 1. At 1 draw a tangent to the arc and produce it to meet the radii C A and C B produced at 2 and 3. A circle inscribed in the triangle C 2 3 will be inscribed in the sector.

This method may be employed to inscribe any number of equal circles in a circle each touching two others and the circumscribed circle. Divide the circle into as many equal sectors as there are circles and proceed as above.

PROB. 8.—*To inscribe three equal circles in an equilateral triangle, each touching two others and two sides of the triangle.*

Bisect each side of the triangle and join these points to the opposite angles. Bisect one of the right angles thus formed as B 1 O by a line 1 4 meeting B 3 in 4. 4 is the centre of a circle, that will touch the 4 sides of the quadrilateral B 1 O 2. The centres of the other circles are found by taking O as a centre and describing arcs at the distance O 4 and cutting the other diameters in 5 and 6.

PROB. 9.—*To inscribe three equal circles in an equilateral triangle, each touching two others and a side of the triangle.*

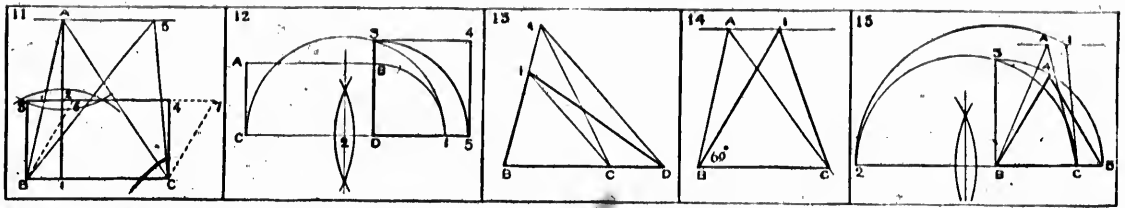
Draw the bisectors of the triangle as A 1, C 2, B 3. Inscribe a circle in each of the equal triangles A O B, A O C, B O C.

PROB. 10.—*To inscribe four equal semicircles in a square, each touching two sides of the square and having their diameters adjacent.*

Draw the diameters and diagonals of the square. With O as a centre and a distance of O 3, draw an arc, cutting the diagonal A D in 5. Join 5 B. 6 where this line cuts the diameter 3 4 is one end of the diameter of the semicircle. From 6 draw lines 6 7 and 6 9 parallel to the diagonals of the square. Draw 9 8 and 8 7 similarly. On these lines draw semicircles touching two sides of the square.

Draw a group of tools used (1) by a house painter; (2) by a carpenter; (3) by a bricklayer.

Use the next page for optional drawings.



PROB. 11.—*To draw a rectangle equal in area to a given triangle A B C.*

From the apex A of the triangle draw a perpendicular A 1 to the base B C. Bisect A 1 at 2. At B and C erect perpendiculars, meeting the bisecting line at 3 and 4. NOTE.—Triangles on the same base and between the same parallels are equal. The same applies to parallelograms. A B C equals in area 5 B C. 3 B C 4 equals in area 6 B C 7.

Describe a triangle equal to a rectangle.

PROB. 12.—*To describe a square equal in area to a rectangle A C D B.*

Produce C D to 1, making D 1 equal to D B. On C 1 describe a semicircle. Produce D B to meet the semicircle in 3. The square D 3 4 5 described on D 3 is equal to the given rectangle. NOTE.—D 3 is a MEAN PROPORTIONAL between C D and D B.

Describe a square equal in area to a triangle

PROB. 13.—*To describe a triangle equal to another and having a side equal to a given line.*

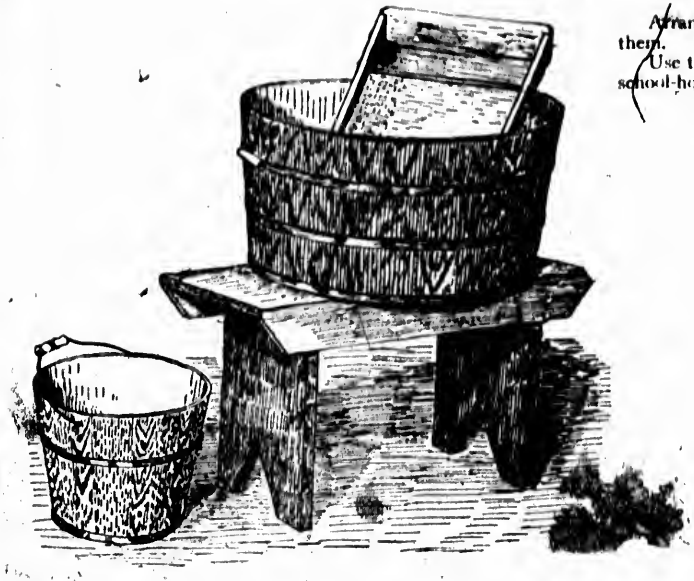
A B C is the given triangle. Produce one side to D so that B D is equal to the given line. Join A D. Through C draw C 1 parallel to A D. Join 1 D. Then B 1 D is equal to A B C.

PROB. 14.—*To describe a triangle equal to a given triangle and having an angle equal to a given angle, say 60°.*

A B C is the given triangle. At B draw B 1, making an angle of 60° with B C. Through A draw a line A 1 parallel to B C. Produce the line from B to meet this parallel in 1. Join C 1.

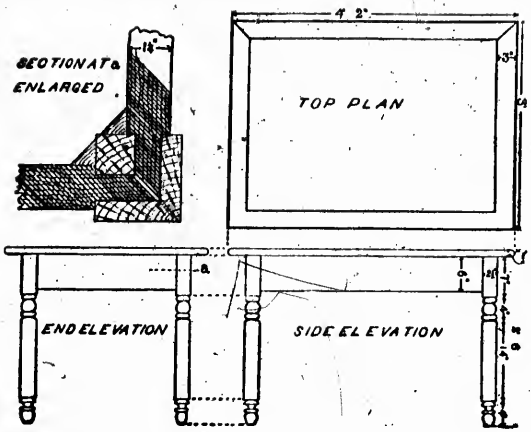
PROB. 15.—*To describe an equilateral triangle equal in area to a given triangle.*

A B C is the given triangle. Each angle of an equilateral triangle is equal to 60°, because the three angles of every triangle are equal to two right angles or 180°. At B make a triangle 1 B C, having its angle at B equal to 60°, as in the last problem. Find a mean proportional between B 1 and B C. (See Prob. 12.) Produce C B to 2, making B 2 equal to B 1. On 2 C describe a semicircle. At B erect a perpendicular B 3, meeting the semicircle at 3. With B as a centre and distance B 3, draw an arc, cutting B 1 in 4, and B C produced in 5. B 4 5 is the equilateral triangle required. NOTE.—Any isosceles triangle having any vertical angle may be described similarly.



Arrange a tub, wringer and pail in a group and draw them.

Use the next page for drawing some building such as the school-house, a house or a barn.



Make a working drawing of a table or book-case, on next page, from measurements. Draw a perspective view of the same object.

Draw anything you wish on the rest of this page.

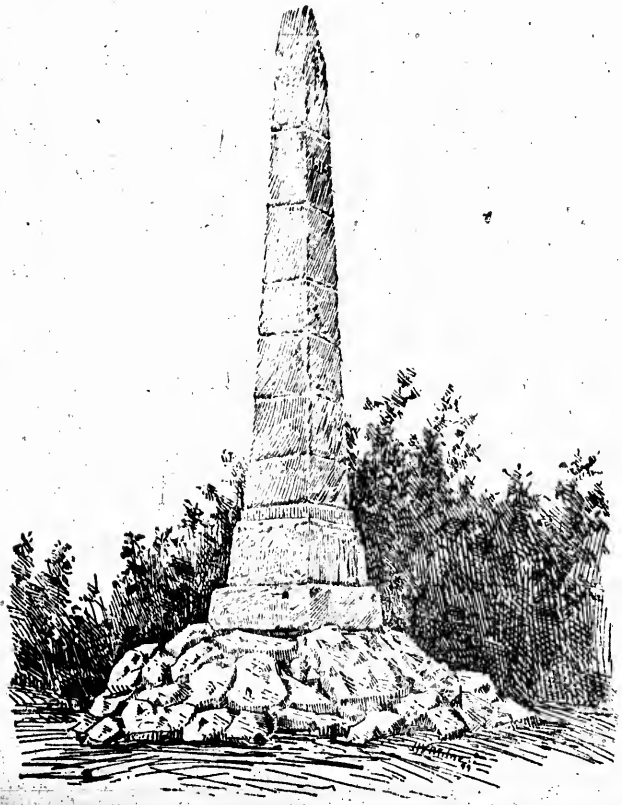
Draw a group similar to this one.

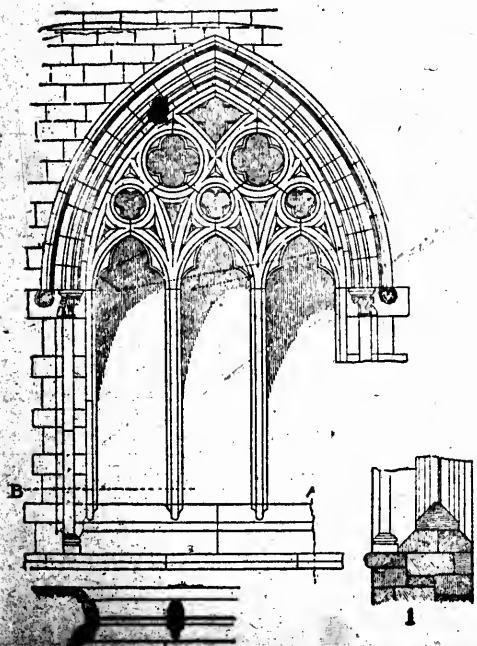
Draw the appearance of a trunk and valise in two or three positions on the next page.

This is a picture of the monument erected in 1895 to commemorate the victory of the British and Canadians under Col Morrison, over the troops of the United States, under General Boyd, at Crysler's Farm, in the County of Dundas, on Nov 11th 1813. The monument was unveiled by a fitting ceremony Sept. 25th, 1895.

Name other public monuments in Canada, and tell when and why they were erected

Draw any monument in your vicinity

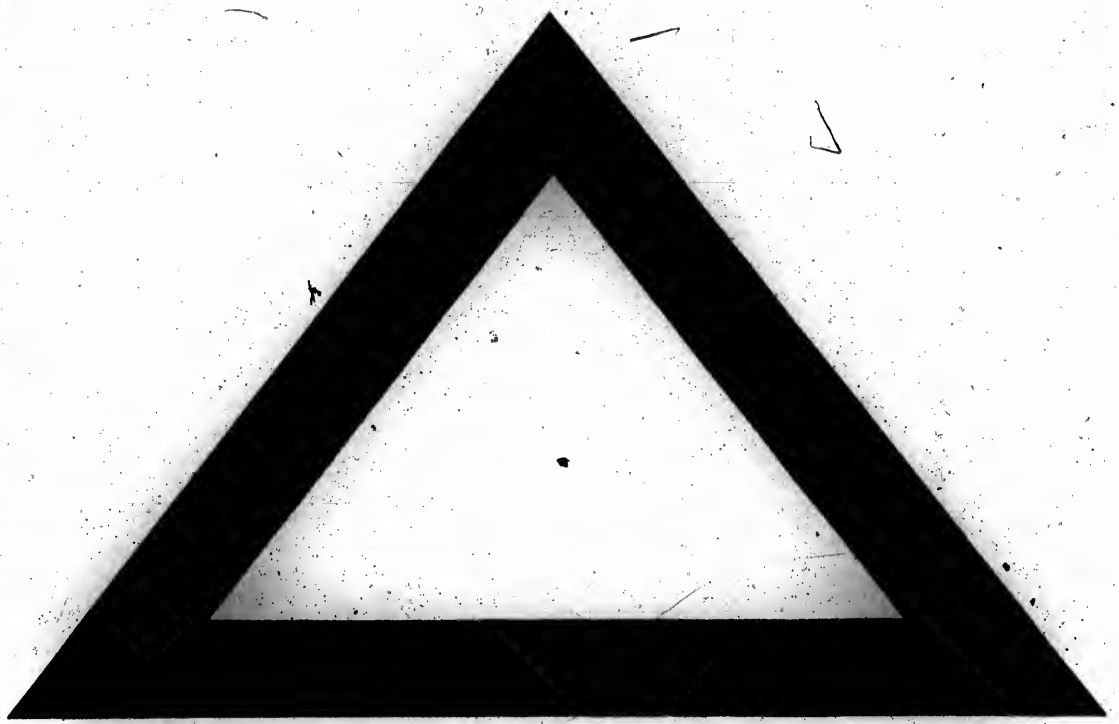




The first two capitals are from the hospital of St. Cross, near Winchester, in England. The hospital was founded by Henry of Blois, Bishop of Winchester, in 1136, and enlarged and partly rebuilt by Cardinal Beaufort. These capitals are magnificent examples of the Norman style of Early Christian Ornament. The next is a capital from the palace of Frederick Barbarossa, of Germany. It is an example of the Early Christian in Germany.

The next capital is Early English of the Gothic style. The principal characteristics of the Gothic style are geometrical window tracery showing the trefoil, quatrefoil and circle; flying buttresses; crocketed pinnacles; complicated mouldings; clustered columns; the capitals generally circular; and an extensive application of foliage with the trefoil leaf as the most characteristic ornament. All these elements may be observed in the Anglican churches in this country, which are built after the style of similar churches in England.

The window is a Gothic one showing geometric tracery and the use of the trefoil and quatrefoil. Windows similar in construction may be observed in nearly every town in Ontario.

2 is a horizontal section of the window at B, while 1 is a vertical section at A.

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