Drawing--No. VI.

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NOTE.—To avoid repetition, references will frequently be made to figures appearing in preceding numbers. It will be well, therefore, for readers who wish to follow these articles to keep back numbers by them

HEXAGONAL PLANES AND PRISMS.

Although the hexagon is a figure that does not frequently occur in buildings or large objects, and on that account rather difficult to illustrate by suitable concrete examples, it will be well to devote a small space to hexagonal planes and prisms, as the time spent in the study of them will be amply repaid by the truths obtained. First draw a hexagon carefully by geometery, and note that, if diagonals be



drawn, it consists of six equilateral triangles, also if perpendicular lines be drawn from the ends of one side, as $a \ e$ and $b \ d$ in Fig. 30, the diagonal $f \ c$ is divided into four equal parts. This is an important fact to bear in mind

in drawing this figure in any position. We have already seen how rectangular planes appear much narrower when placed flat and may therefore expect great changes in the apparent shape of hexagons when placed upon them. Take a drawing board and draw a hexagon with chalk upon it the full width of the board, or if it be preferred a hexagon may be cut from paper or card and placed on the board. First place the board as in Fig. 31, with one edge towards the observer. From what we have seen above and our previous knowledge of rectangular planes, we know that a b, f c, and e d will appear as horizontal lines,



the foreshortening, f c will appear nearer to e d than to a b, and because a c and b d are parallel to the sides of the board, they will appear to run to the same point on

but on account of

the eye-level. The method of drawing is now apparent. First obtain the points $a \ b$ and draw the lines mark the points f, g, h, i and c, making all the divisions equal to $g \ h$ or $h \ i$. Join f to e and a, and

mark the points f g h i and c, making all the divisions equal to g h or h i. Join f to e and a and c to b and d and the hexagon is complete. The figure should now be drawn in the same position without the aid of the board. The only difficulty will be to obtain the direction of a e and b d and the apparent width of the hexagon. This, however, should be no trouble if the figure a b d e be treated as a horizontal rectangular plane, and the rules for drawing such be correctly observed.

When the board is placed as in Fig. 32 we may



fix the points a and b as before; draw a e and b d to meet in the same point on the eye-level as the sides of the board, and then draw the diagonals. The point f should now be placed at a rather greater distance from g than g from h, and c from i at rather less than i from h. The reason for this will be apparent when we remember that the four spaces are really equal, but on account of the line f c receding from us, the spaces will gradually get smaller from f to c. Compare Fig. 13. By joining the necessary points the hexagon will be complete.

The figure should now be drawn in this position without the aid of the board. First draw a b d e as a horizontal plane, using the pencil as in Fig. 7, toobtain the direction of a e and a b. Cut off their apparent lengths and draw e d towards the same vanishing point as a b, and b d to that of a e. Join the diagonals to meet in h, through which a line is drawn in the same direction as a b and e d. Mark the points f and c and join to complete the hexagon.



When this figure forms the end of a hexagonal prism (Fig. 33) the above method must be adopted, as we cannot use the board to assist. To complete the

