STUDENTS' DEPARTMENT.

DOMES.

DOME is usually understood to mean a roof which is round or polygonal horizontally and of which any vertical section is either a round or a pointed arch. There happen to be none of elliptical or any other section than these. But some, especially in the East, have what is called an ogival outline, convex below and concave towards the top, and these are generally called cupolas, though there is no real distinction. Most of the great European domes have an opening or eye at the top, on which stands a lantern, except in the Pantheon at Rome, where the eye is open. Until modern times all the domes worth notice were of masonry—i. e., stone, brick, tiles, or pots, which last were used for lightness.

Pointed domes are much larger than hemispheres, having lost the flat top which has the greatest bursting pressure. A dome generally by the revolution of an equilateral arch, or one of sixty degrees, requires only a thickness of 0.137 diameter, 16½ in. for 100 ft., and one of seventy degrees requires 20 in. The tension at the bottom of a sixty-degree dome is only ·15 of its weight, which weight, however, is 372 of a hemisphere on the same base, their heights being as 173 to 1.

For the same reason pointed domes are fitted for carrying a lantern, but they are not much benefited by tapering, having already lost the most oppressive parts. The Florence dome, across the flat sides of the polygon, is about seventy degrees of the circle of its curvature. Both in hemispherical and pointed domes the weight of the lantern they will carry varies practically as the cube of the thickness. Moreover, a lanterned dome requires tying much higher up than a plain one. In short, the cone is the only proper way of carrying a stone lantern. The cone at St. Paul's has a great chain round the base, which is probably superfluous, as the drum below it seems to be thick enough to contain the requisite slope, and visibly leans inwards besides.

Ribs inside a dome weaken more than strengthen it, as some persons imagine, unless they are themselves deep enough to be stable as independent arches, or unless they decrease in width and weight upwards like a lune, as those in the Pantheon do, which also is so enormously thick at the haunches that it has superabundant stability. Some of the Indian domes are thick enough for arches, and they have neither eyes nor lanterns. Polygonal domes may be considered as composed of a small number of widish lunes, and only differ from round ones in being rather weaker for any given thickness and size.

Domes require no wooden centering to build them on as arches do, until they get near the top—i. e., so long as each stone is laid on the ring of stones below it will not slide inwards. And if they are notched to prevent sliding the whole dome may be built without centering. The dome of Mousta in Malta was so built in this century by a common mason, who must, however, have been a man of genius. There would be no difficulty in building a dome of almost any size of bricks or stones, with the help of hoop iron in all the lower courses up to about twenty-three degrees from the bottom, and then less up to fifty-two degrees, and higher if it has to carry a lantern.

PROVINCE OF QUEBEC ASSOCIATION OF ARCHITECTS.

MEMBERS and students of the above Associat on are invited to compete for a design for a seal, envelope and letter heading, to be delivered to the Secretary, 97 St. James Street, Montreal, before the 1st of August next. The design must be made so that the seal may be omitted or used as desired. The author of the best design will be awarded a prize of $10, the best four designs to be published in the CANADIAN ARCHITECT AND BUILDER.

USEFUL HINTS.

There is an advantage in varnishing those parts of inside blinds which face the light, with good spur varnish. The exposure to weather and to the rays of the sun to which the facings of the blinds are subjected when closed, soon bleaches or blisters the ordinary furniture varnish that is commonly used on interior work. The exterior varnish being a slow dryer, withstands the elements much better than the varnish commonly used on interiors.

GLASS THAT EXCLUDES HEAT.—The announcement made of a German method of producing glass which will transmit light freely, but not heat, is supplemented by some details as to the process of manufacture. A plate of this material 4-10ths of an inch thick, containing 28 per cent. of iron in the form described as ferrous chloride, allowed only 4.06 per cent. of radiant heat to pass through it, while another plate of equal thickness, and and containing quite as much iron in the form of ferric chloride, permitted 11 2 per cent. to pass. The chemical distinction is very small, but the effect is said to be marked. A new thin slab of this glass permitted less than one per cent. of the heat of gas flames to pass, although transmitting 12 per cent. of heat from sunlight. Ordinary window glass, on the other hand, lets some 86 per cent. of heat through.