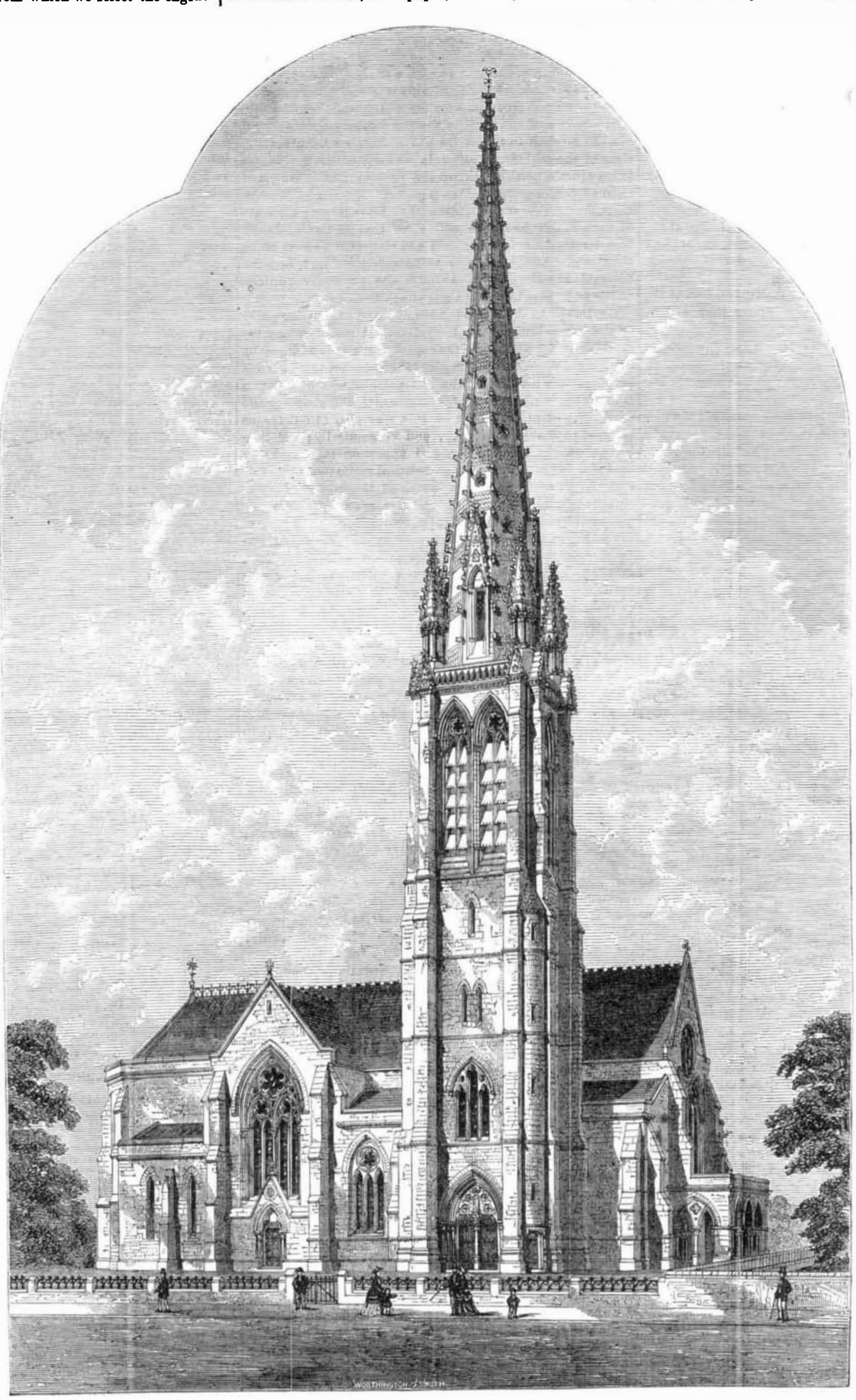
EMANUEL CHURCH, CLIFTON, ENGLAND.

The large and commercially important city of Bristol is so crowded with docks and warehouses that its merchants are driven out of town for residences; and the beautiful parks and avenues of Clifton, which crown the noble downs over hanging the opulent metropolis of western England, are studded with many exceptionally fine public buildings. One of the best of the recent structures is a church of the perpendicular order, of which we present a view. The building, says the London *Builder*, from which we select the engraving, is spacious and lofty, measuring internally 122 feet by 60 feet, and the roof carried through a uniform hight of 60 feet. The chancel is apsidal, and measures 39 feet by 28 feet. The nave is of five bays, with lofty arcade arches springing from circular columns. Arcades of two bays divide north and south chapels from the chancel, designed for vestries and organ chamber.

The church is built of the native stone, of a reddish tint, with bands of deep red sandstone. The dressings are of Bath stone; the chancel steps and dais of Limerick marbles and encaustic tiles. The reredos is carved with subjects in high relief. The steeple reaches to a hight of 222 feet, the tower being 108 feet, the spire 114 feet high.



EMANUEL CHURCH. CLIFTON NEAR BRISTOL ENGLAND.

The Polysphenic Ship.

Proceeding from the well known fact that when flat bottomed vessels are urged forward by a strong propelling force their bows are lifted, and in that way some advantage of speed is gained, Mr. Charles Meade Ramus, M. A., Trinity College, Cambridge, designed a ship in which the bottom was composed of two parallel and consecutive inclined planes, so that, being simultaneously lifted fore and aft by two similar lifting forces at the highest rate of speed, it might be able to so maintain its equilibrium as neither to drop forwards nor turn over. Experiments with models showed that a vessel so constructed would, when driven at a sufficiently high speed, rise evenly over the water, so as to skim over it. Further trials proved the superiority of five or six inclines over the lesser number. From the results of his experiments Mr. Ramus calculates that 5,000 horse power will give to a 2,000 tun ship any speed up to sixty knots an hour. Having employed rockets as the propelling power in his experiments, the idea was suggested of using the vessel as a rocket float. Mr. Ramus estimates that a 100 lbs. rocket would be capable of driving a float of one tun displacement at a hundred knots an hour to a distance of two miles. This float, he adds, would carry quite half a tun of explosives, and it is at least very doubtful whether the sides of any ironclad would resist the shock of the explosion that would take place on contact.

Effect of Heat on Textile Fabrics.

Recent experiments on disinfection by means of heat, made by Dr. Ransom, of Nottingham, England, show that white wool, cotton, silk, and paper may be heated to 250° Fah., for three hours without apparent injury, although the wool will show a faint change in color, especially when new. The same may be said of dyed wools and printed cottons, and most dyed silks; but one kind of white silk easily turns brown by this heat, and pink silks of some kinds are also faded by it. The same temperature will, if continued for a longer period, slightly change the color of white wool, cotton, silk, paper, and unbleached linen, but will not otherwise injure them. A heat of 295° Fah., continued for about three hours, more decidedly singes white wool, and less so unbleached and white cotton and white silk, white paper, and linen, both unbleached and white, but does not materially injure their appearance. The same heat, continued for about five hours, singes and injures the appearance of white wool and cotton, unbleached linen, white silk, and paper, some colored fabrics of wool, or mixed wool and cotton, or mixed wool and silk. It is noteworthy that the singeing of any fabric depends not alone upon the heat used, but also on the time during which it is exposed. In these experiments the heat was obtained by burning gas with smokeless flames, and conducting the products of combustion, mixed with the heated air, by means of a short horizontal flue into a cubical chamber through an aperture in its floor, and out of it by a smaller aperture in its roof. Fixed thermometers showed the temperature of the entering and out-going currents, which represent the maximum and minimum temperatures of the chambers. A self-acting mercurial regulator maintained the temperature of the entering current at any required degree.

The Woolwich Furnace.

The Royal Gun Factory, at Woolwich, has been for some time past conspicuous for its efforts to economize fuel, both for steam and manufacturing purposes, and it is now possessed of a novelty in furnaces, in which the economy of fuel is a striking feature. It is at present applied both to reheating and puddling, and its consumption of fuel and yield of iron taken with scrupulous accuracy.

The saving of fuel is, over a period rising to six months, an average of 40 per cent, while the saving in fettling in the puddling furnace is scarcely less remarkable. The durability of the furnace is also much greater, and the provision against an excess of free air—the pestilent source of waste in the iron trade—is peculiar and effectual in saving iron, whether in reheating or puddling. The plan on which the furnace is constructed is to provide an ordinary furnace with an upcast at the rear of the existing combustion chamber, and in contact with it. The products of combustion from the furnace are led into the said upcast by passing either over, under, or around the body of the furnace. In the upcast is placed a conical cast iron tube in a vertical position, and between the sides of which and the upcast are spaces for the free circulation of the products, the heat of which is taken up by the cast iron vessel or tube. This tube is fitted with a hopper at the top, and check dampers, by which the fuel is let into it without the intrusion of air. Its capacity is equal to containing 12 cwt. of coal, which is kept up by regular charges of about 2 cwt. Its temperature is usually at a bright red heat, and as the fuel descends it is freely rarified. It is provided with an outlet into the combustion chamber, through which a constant stream of carbureted hydrogen is passing over the fuel on the fire bars, taking up the free air passing through the interstices of the fuel, and arresting their wasting action in the furnace. The remainder of the fuel that becomes coked is passed by the same channel on to the fire bars coked and hot, so that no cold fuel passes into the combustion chamber. The amount of heat thus carried back into the furnace, and which is the great economizer, can be partially estimated from the fact that, in place of the waste gases passing off at some 3,000 degrees, it does not exceed 500 degrees, as they escape into the stack beyond the region of utility. These furnaces are not complicated by mechanical aids, the combustion being carried on by in draught. They are easy of adaptation to existing plant, incur but a trifling expense, and give great durability to the bricks, being free from the chemical action so common to furnaces of less perfect action. The present puddling furnace has yielded 250 tuns of iron—the work of an ordinary furnace—and is far from its termination. Here a want, urgently pressed upon our attention by ironmakers, seems to be met.—*The Engineer*.