

THE BUILDINGS FOR THE CENTENNIAL EXHIBITION.

The Commissioners who have charge of the arrangements for the Centennial Exhibition, to be held at Philadelphia in 1876, have recently given to the public definite details of the buildings to be erected in Fairmount Park for the purpose. The structures are five in number, the Main Building, the Art Gallery, and the Machinery, Agricultural, and Horticultural Halls. We publish on page 197, from the *Scientific American*, a view of the Art Gallery.

The Main Building is to be 1,880 feet long and 464 wide, covering 20.02 acres of space. The whole will consist of one floor only, except in the projections and towers, where galleries, giving additional space, will be provided, adding 1.45 acres to the available area. The great length of the building has rendered advisable the breaking of the roof lines by the addition of three transepts or cross avenues. The roof is chiefly of the height of 70 feet from the ground, the towers at the corners being 75 feet high. The central portion, 184 feet square, rises to an elevation above the rest of the building, and is surmounted by four towers 120 feet high. The central avenue will be 120 feet wide, with another, 100 feet wide, on each side of it. The passages for promenade, between the long lines of exhibited articles, will be mainly 30 feet wide.

The foundations for this structure, which promises to be admirably light and convenient, as well as graceful in appearance, are to be piers of masonry, the superstructure consisting of wrought iron columns, with roof trusses of the same material. The columns are to be of rolled channel bars, with plates riveted to the flanges, and the roof trusses are straight rafters, with struts and tie bars. The columns are to be 24 feet apart; and timber paneling, to the height of seven feet, is to be filled in between the outer columns. Above the paneling, glass sashes are to rise to the top of the building, portions of the sashes being removable for the purpose of ventilation.

The engineers and architects of the structure are Messrs. Henry Pettit, Consulting Engineer of United States Centennial Commission, and Joseph M. Wilson.

Every product exhibited in any part of the entire Exhibition will be considered as belonging to one of the following ten departments - 1. Materials in their unwrought condition, mineral, vegetable, and animal. 2. Materials and manufactures, the result of extractive or combining processes. 3. Textile and felted fabrics. Apparel, costumes, and ornaments for the person. 4. Furniture and manufactures of general use in construction and in dwellings. 5. Tools, implements, machines and processes. 6. Motors and transportation. 7. Apparatus and methods for the increase and diffusion of knowledge. 8. Engineering, public works, architecture. 9. Plastic and graphic arts. 10. Objects illustrating efforts for the improvement of the physical, intellectual and moral condition of man.

In the main building will be located portions of all of the above departments, except No. 6, which will be placed in the Machinery Hall, and No. 9, to which the Art Gallery will be especially devoted.

The departments will be arranged in parallel zones lengthwise of the building, the zones being of different widths, according to the bulk of the products exhibited in the particular department. The States and countries exhibiting will be arranged in parallel zones crosswise of the building, these zones also being of different widths, according to the amount of space required for the exhibits of each country. Between each department and each country will be passage ways distinctly marking the limit of each. The result of this dual system will be that any visitor or student, desiring to compare products of the same kind from different parts of the world, may do so by passing through the building lengthwise, keeping in the zone devoted to the particular department, and any one desiring to examine only the products exhibited by any particular country or State may do so by passing through the building crosswise, in the zone devoted to the particular country or State.

THE ART GALLERY.

is of a highly ornate design, and is intended to be the best and handsomest building yet erected on this continent for the purpose. It is to be constructed of granite, glass, and iron, and will be thoroughly fireproof. Its dimensions are 365 feet long, 210 feet broad, and 72 feet high, with a dome, surmounted by a figure of Columbia, rising to 150 feet from the ground.

The Central Hall will be 95 feet long, and the Pavilions, one at each end of the building, will be 45 feet. The Pavilions will be connected to the Central Hall by arcades, each 60 feet long by 40 feet high.

The lighting arrangement, the most important point in the construction of an art gallery, appears to be thoroughly efficient. From the east and west sides of the Central Hall extend the galleries, each 98 feet long, 48 feet wide, and 35 feet in height. These galleries admit of temporary divisions for the display of paintings. The center hall and galleries will, altogether, form one grand hall 287 feet long and 85 feet wide, capable of holding eight thousand persons, nearly twice the dimensions of the largest hall in the country. From the two galleries, doorways open into two smaller galleries, 28 feet wide and 89 feet long. These open north and south into private apartments which connect with the pavilion rooms, forming two side galleries 210 feet long. A corridor 14 feet wide opens into a series of private rooms. Mr. H. J. Schwarzman is the architect, and Mr. R. J. Dobbins the contractor.

HEAT WITHOUT COALS.

If there be one principle of industrial economy more firmly established, and of more universal application than another, it is that which insists on the economic advantages of a division of labour. In every department of industry we find the division of labour and its logical sequence, the specialisation of manufactures, carried out to an incredible extent and with unfailing success. Everyone is familiar with, and appreciates the results of, that minute sub-division of trades (upwards of a hundred in number), each confining itself to the elaboration of a single portion of that wondrous complex of mechanism, and marvel of cheapness—a modern chronometer; but there seems a certain reluctance in accepting in its entirety the proposition that, if any product, whether material or dynamic, is in daily requisition by a large number of individuals congregated within a small area, their requirements will be most efficiently and economically supplied, by handing over the whole business of supply and manufacture to a single individual or corporation, whose whole attention can be concentrated on perfecting the means of production and distribution. This once fairly stated seems, however, so obvious an axiom that it is unnecessary to insist on it, further than to point out, as instances of the practical embodiment of this idea, the system on which water and gas are supplied, and refuse removed in our towns. With the advantages of these forms of centralisation we are now so familiar that no one would be guilty of the folly of rejecting their use and depending on his own isolated exertions. It requires an effort even to conceive the possibility of every household in the metropolis, for instance, being obliged to fetch his own water (or buy it at the door), to make his own gas, and undertake the removal of his household refuse independently of his neighbours. Such a state of affairs would be considered intolerable, and rightly so, by the present generation, since it has experienced the benefits of an arrangement which brings to, and distributes through, our houses light and water in a constant and automatic supply, while superfluous matter is removed with a minimum of trouble and inconvenience. In the matter of heating, however—a service in as universal request as a water supply—we find existing provision utterly behind the requirements of the age in every particular, and, indeed, in no better condition than they were a century, nay, several centuries, ago.

Though the home-manufacture theory has been exploded in every other department of urban social life, here it reigns supreme, and every man still may boast not only of being his own heat-manufacturer, but of having in each room, a separate factory in which the whole process is carried on—but at what a cost!

The raw material is indeed brought to the consumer's door, but in the most inconvenient form, and by a system of transport at once extravagant and inefficient; its solid condition rendering the pneumatic or hydraulic methods of distribution inapplicable. So that, in place of being able to draw at any moment from an unfailing reservoir, a supply exactly adequate to the varying requirements of the individual, it is necessary to store up sufficient for many weeks' consumption, locking up capital and wasting space, while, owing to the fluctuating character of a small consumption, one's calculations are