

### THE CENTENNIAL BUILDINGS--THE INDUSTRIAL PAVILIONS.

In this division of the numerous structures (some 150 feet in all), the Photographic Hall claims our first attention. It covers a space of 258 feet long x 107 wide, its length laying east to west. The interior is fitted up with screens for the exhibition of photographs; these are 28 in number, and 4 of them are 19 feet long, and 24 are 24 feet long each. Both sides of the screens are valuable as exhibiting space; and allowing 10 feet square to each exhibitor, 1513 exhibitors can be accommodated on the screens alone. The halls of the building will accommodate 532 exhibitors, giving them also 10 feet square each, with some T-shaped screens in addition, giving 720 square feet, a total of 19,080 square feet being thus appropriated.

The screens stand 16 feet apart, and in some cases floor space can be gained for exhibits between them; and floor space will be had for the same use all along the middle avenue between the ends of the screens. The T-shaped termination of the screens towards the middle avenue is available for pictures, and will be about 2½ feet wide. These ends of the screens, being covered with pictures, will greatly improve the effect in viewing the middle avenue along its entire length, as in sharp perspective it has the appearance nearly of a continuous wall of pictures.

The main purpose of it, however, is to stiffen and strengthen the screens.

It will be seen from this that there will be an exhibition of photography here such as the world never saw, if there is more enterprise shown in filling the space allotted than there is in subscribing for the stock to build it. In this matter we must do our best, or our friends will beat us. Dr. Vogel says that there will be a very elegant and interesting collection sent from Germany. It left Berlin in February last, we believe. Dr. Horning, editor of the *Photo. Archiv.*, in Vienna, writes that a fine collection is coming from his city. He says: "I hope to be able, according to the invitation of our American co-workers, to excite an animated participation of our photographers, and I shall be glad if I can succeed, to enable me to show you my esteem for the extraordinary exertions you have made in the interest of our art."

M. Adolph Braun, the renowned carbon art printer and publisher, has applied for 265 square feet of space, and promises to make a famous exhibit. Many French, English, and other foreign exhibitors will join in the display.

The Carriage Builders' Pavilion, next illustrated, will afford a most interesting show. The exhibits will consist entirely of pleasure carriages; and the light-running vehicles for which this country is famous will sus-

tain our reputation in this branch of industry. The position of the building is north of the Main Building and west of the Art Gallery, on the main avenue leading from the Art Gallery to Machinery Hall, Government and other buildings. It is also near Belmont Avenue, the principal drive through the grounds.

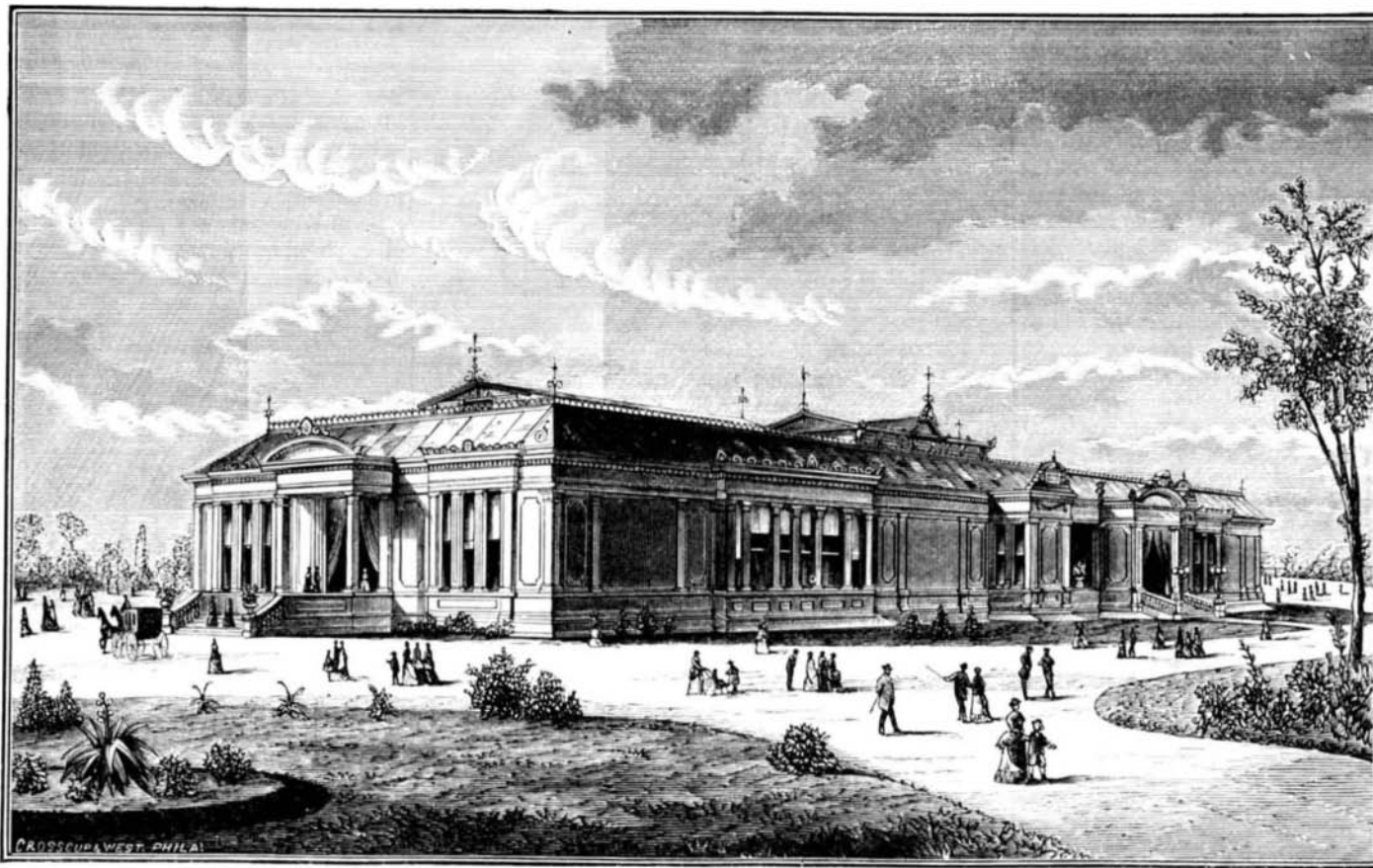
The building is 346 feet long, 281 feet wide, in shape a parallelogram. The material used in its construction is

wood, sheathed with corrugated iron. The building is one story high, with hipped roof, having five skylights running the full length of the building. From the floor to the top of roof is 36 feet; to main plate, 24 feet. Four principal entrances allow of the easy ingress or egress to and from the building. Besides the skylight, the building has large windows, 14 feet in height on the side. Offices are placed at each entrance of the building, affording accommodation to the many visitors. The south half of the building is allotted for the carriage trade; the other half to palace cars and stoves.

The amount of square feet allotted to foreign countries is as follows: Great Britain, 4,500; Germany, 210; Italy, 224; Canada, 2,700. There will be about 75 exhibitors of car-

The structure occupies a conspicuous position near the miniature lake, on a line between the United States Government Building and Machinery Hall.

The plan of exhibition is an alphabetical arrangement of the partial files of each newspaper or periodical in such a manner as will make them instantly accessible: the space devoted to each bearing a label with the name of the publication printed thereon, and further designated by a number, by means of which a stranger, upon reference to his catalogue, will be able at once to approach the section of the building where the particular journal which he desires to examine or refer to may be found. The cases containing these files will form alcoves similar to those in public libraries for the arrangement of books; and these alcoves form long tiers, one on each side of the building throughout its entire length, a portion of the space between being reserved for the accommodation of attendants, leaving a passage way for the public 18 feet in width, extending from one end of the structure to the other. The second story, approached by four flights of stairs, is devoted to reading rooms for the accommodation more especially of newspaper men, and will be supplied with conveniences for correspondents. Mr. George P. Rowell, of New York, has assumed the management of the enterprise, and with him will rest the responsibility



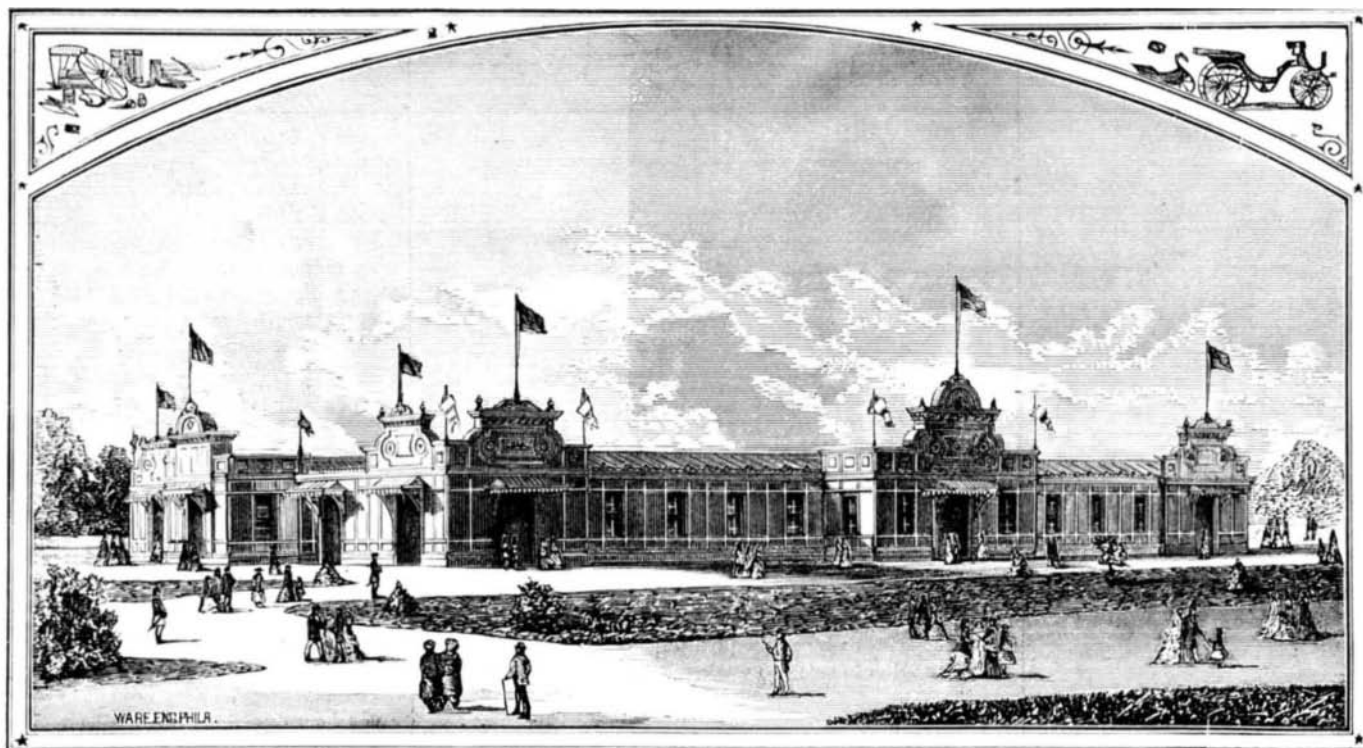
THE PHOTOGRAPHIC HALL.

riages from France who will probably exhibit in the United States.

Our next engraving shows the building erected by the United States Brewers' Association, in which is made a grand display of all the materials and processes employed in the brewing of beer, which will be exhibited in full operation. For this purpose the large and elegant building represented is erected by the Association, at an expense of \$70,000. The building is 300 feet in length and 100 feet wide, and presents a very ornamental appearance. The brewers claim that the industry in which they are engaged is hampered and imperiled by the popular prejudice which exists against the use of distilled liquors. Fermented refreshments like beer, they allege, ought not to be classed with the intoxicating distilled

of making it what it should be.

Our last engraving represents the building erected by subscriptions from members of the shoe and leather trades, for the accommodation of the industries in which they are especially interested. There is probably no branch of industry in which labor-saving machinery has been carried to greater perfection than in the boot and shoe trade, and this part alone will constitute one of the principal features of the exhibition. Here will be seen machinery for the performance of almost every conceivable operation in the trade, from mills for grinding the bark with which the skins are tanned, with currying, hairing, graining, splitting, pebbling, polishing, buffing, and coloring leather, up to the intricate and ingenious machines employed in the cutting, sewing, pegging, forming, and finishing all varieties of boots and shoes; and their name is legion. There will be machines which make pegs, and secure the soles upon the boots and shoes, by means of them, in one operation; and others which make kinds of screws of brass wire, and insert them in the shoe or boot for the same purpose. This building is 256 feet long by 160 feet wide; the roof is supported by columns 16 feet apart, the central section being a curve 80 feet wide, of the Howe truss pattern, over which is a louver ventilator 26 feet wide, running the length of the building, 60 feet above the



THE CARRIAGE EXHIBITION BUILDING.

liquors which are productive of such widespread wretchedness. The use of beer they claim to be highly beneficial to mankind, and they intend to prove this by a national exhibit of the most extensive character. Their object is not to induce a man to drink more beer, but to encourage more men to drink beer.

Next on our list of illustrations is the newspaper building, which will contain nothing but an exhibition of newspapers.

The pavilions are 20 and 30 feet high. The ground floor of the building is divided as follows: An aisle 15 feet wide and 300 feet long runs through the center, and on either side is one 10 feet wide, parallel with the center aisles. Across the center of the building is a passage way 10 feet wide, at one end of which is a doorway leading to Machinery Hall on the north. The east and west sections of the ground floor have aisles 14 feet wide. There are eight main exhi



bition spaces for exhibits (bounded by the aisles) 20 feet in width and 117 feet in length, and four exhibition spaces of 20 feet in width by 114 in length.

These illustrations and descriptions show clearly the various styles which have been chosen for the buildings, the selection being governed by circumstances. Altogether, a lavish provision of space has been made, and there will be no just reason for complaint of want of room. We are glad to know that the exhibits which have arrived and are arriving from all parts of the world will justify the managers in providing such extensive and costly accommodation; and we anticipate an exposition which shall redound to the credit of the United States.

**Sunday at the Centennial.**

It has at last, after much discussion, been decided that the Exposition shall remain closed on Sundays, the Centennial commission voting in the ratio of three to one against adopting the minority report to the contrary. All the buildings and grounds will be closed to the public on the Sabbath.

We think the decision of the commission is the one which will please the majority of our people best. The strong argument against closing lay, first, in the fact that Sunday is the only opportunity afforded to working men to visit the Exposition by daylight; and second, that many citizens and foreign visitors do not observe the Christian sabbath, and hence should not be debarred entrance on a day which, to them, is no different from any other in the week. While there is considerable reason in these views, they manifestly should not prevail when the Exposition is regarded in the light of a national undertaking. The workmen who would be benefited are only those who reside within short distances of the Centennial, a very small majority compared with the entire working class. In this country, moreover, we live under the rule of the majority, and the sabbath of that majority is the Christian sabbath, a day which our ancestors of one hundred years ago venerated and reverently observed.

Moreover, foreigners will come here to study us and our institutions as they are, and one of those institutions is certainly the sabbath as a day devoted to rest and religious

duties. Hence, the question after all reduces itself to whether a small minority of one class of the population, plus a still smaller proportionate minority of the entire religious community, are to be accommodated in opposition to a pub-

lic sentiment which overwhelmingly prevails. There are various other considerations, notably the enforcement of extra work among the employees on the

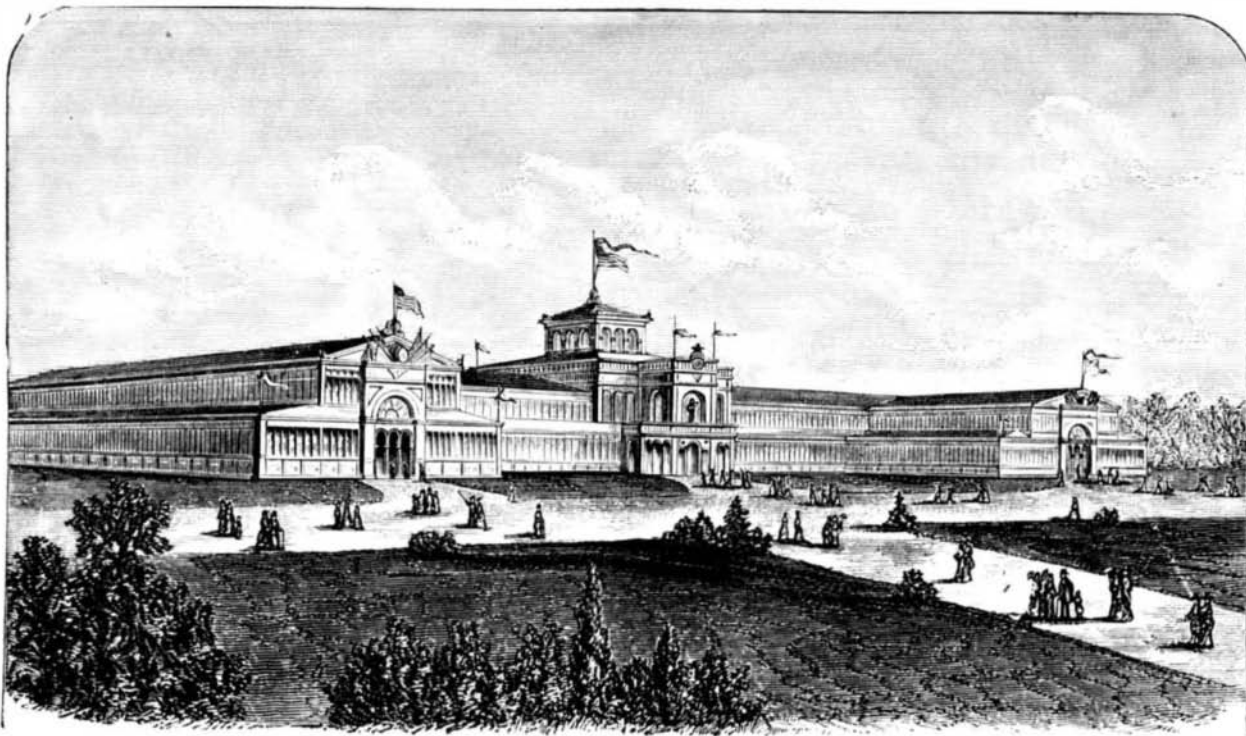
scores of instances of like deceptions being practised which probably have come under his notice; so that at the present time, antiques in Naples, coins in Rome, pipes and pottery in the East, and the thousand bits of *bric-a-brac* that travelers delight in gathering are either the handiwork of the present inhabitants of the historic localities, or, far more likely, have their origin in Birmingham, England, that world's supply shop for all heterogeneous articles, from big Japanese idols down to pins.

We did cherish the idea that the relic-manufacturing industry had not traversed the Atlantic; and although we might secretly laugh at the friend who proudly exhibits Waterloo bullets and Roman *oboli*, we were fain to accept as genuine flint lock muskets which have been through the Revolution, or the moth-eaten old uniform kept in the garret since the days of 1812, and now brought out for exhibition in this Centennial season. But this era of confidence has passed. We now point the finger of scorn at the musket, and express doubts as to whether the uniform is not one on which army officials have been testing the much-veiled moth patent. We might have continued in our innocence, despite the fact that General Washington's headquarters have sprung up over the land like mushrooms, necessitating the supposition that the hero must have been endowed with ubiquity, or else have spent his existence in traveling from one to the other; but when we regard the number of his favorite and

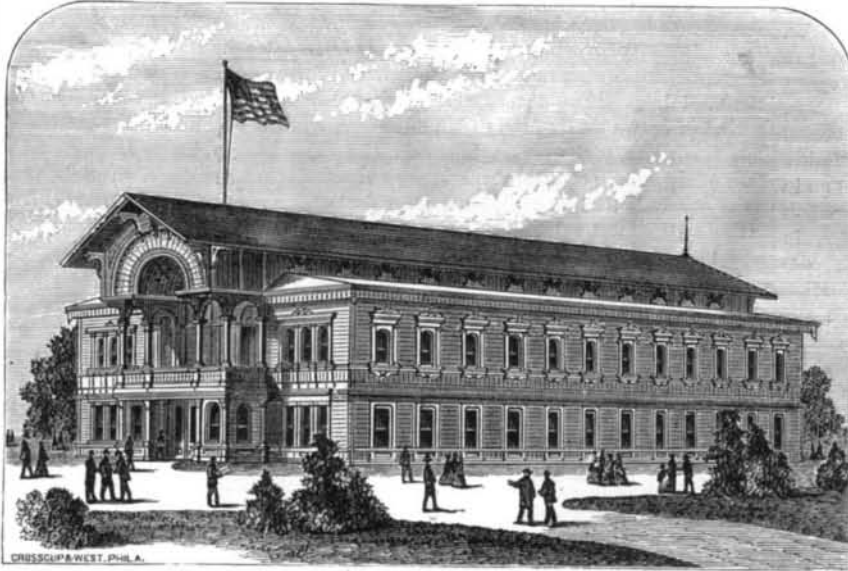
grounds, and the interference with the quiet enjoyment of the day of rest by those residing in Philadelphia and its suburbs, which need not here be reviewed. As we said in the beginning, the decision will be acceptable to the greatest number of our people.

**Centennial Relics.**

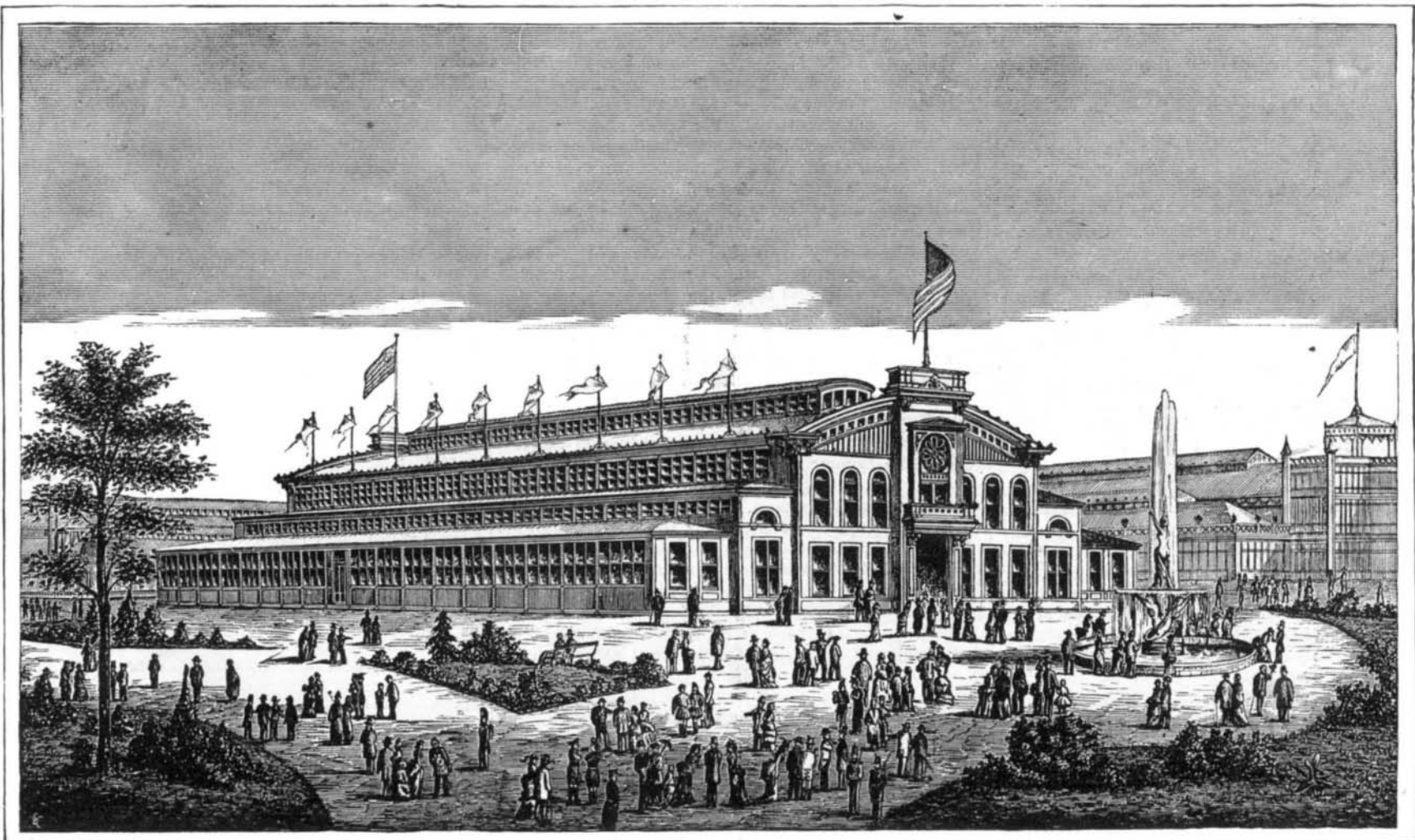
Every year, it is said, the battlefield of Waterloo is carefully planted with battered bullets, odds and ends of accoutrements, and other rubbish, which in the following year are dug up and sold to credulous tourists, as relics of the conflict, by the enterprising natives. Not long ago the German government was ruthlessly victimized by some ingenious Arabs who manufactured and sold as real some spurious specimens of rare and ancient pottery. Almost any one, indeed, who has traveled through Europe can add



**THE BREWERS' BUILDING.**



**THE NEWSPAPER BUILDING.**



**THE SHOE AND LEATHER BUILDING.**

only chairs, at least one of which is now deemed indispensable to every well regulated furniture store, and the quantities of abnormally written documents attributed to the Father of his Country which photography reproduces in uncounted and genuine originals, our credulity gives way, and we warn our readers against Centennial relics. During the past winter, we have seen certainly thirty quilted petticoats which fair wearers assured us belonged to Martha Washington, and this is in only one city. How many such garments Philadelphia possesses, we cannot divine. All along Broadway, conscienceless small boys are vending musty, yellow, and ragged newspapers; and not a single anniversary of any revolutionary battle can occur but that copies of the particular ancient paper containing the account of the conflict are sold in New York, in editions so large that the long since dead publishers would have deemed their fortunes secure had their original publications achieved one half the circulation. Lafayette buttons are appearing by the gross; and as for Franklin's canes, their name is legion. There is a strong and growing desire for these things, which bids fair to establish a new and patriotic industry devoted to their manufacture

#### THE DI CESNOLA COLLECTION.

LECTURE DELIVERED AT THE STEVENS INSTITUTE OF TECHNOLOGY, BY WM. HENRY GOODYEAR, ESQ., OF NEW YORK.

"Westward the star of empire takes its course" has always been a fundamental truth with regard to the progress of civilization; and although at the present day the troops of the Czar steadily pursue their march eastward, all our modern nations owe their being and development to a steady movement in the opposite direction. Our ancestors lived in the mountains of Hindostan and called themselves the Aryans; and when they started out upon their migrations westward and settled in Europe, they became in time Greeks, Romans, Germans, Celts, Slavonians: all of whom belong to the same great family, to which the name of Indo-European or Indo-Germanic has been given. We know the fact of their kinship by the similarity of their languages as revealed by comparative philology. Take a single example: Mother in Sanscrit is *mātēr*, in Persian *māder*, in Greek *μητήρ* in Latin *mater*, in Celtic *mathair*, in Slavic *matka*, in Swedish and Danish *moder*, in German *mutter*, in Dutch *mōder*, in Anglo-Saxon *moder*. If such then are the ties which connect us with the ancient world, the study of its civilization proceeds from higher motives than mere curiosity; it is the study of our own first beginnings.

The subject of the present lecture is the development of art, as illustrated by the Di Cesnola (pronounced *Chesnola*) collection in the Metropolitan Museum of Art at No. 128 West 14th street, New York.

General Louis Palma di Cesnola, an Italian by birth, but an American citizen, who fought in our civil war, was appointed Consul to Cyprus in 1865 by the American government. Cyprus is one of the largest islands of the Mediterranean Sea; it is situated near the Syrian coast and belongs to Turkey. Owing to its position, it is a convenient point for the representatives of the European powers to keep watch on each other's movements with regard to the Eastern question. Although the whole island contains less than one hundred and fifty thousand inhabitants, there were then as many as seventeen consuls on it, whose whole business was to bully each other and act as spies for their governments. Di Cesnola, whose government was not involved in the Eastern question, perceived the importance by reason of its lying directly in the route of ancient civilizations, and proved himself the only sensible consul on the island; for he commenced to dig.

The importance of the objects he exhumed soon attracted the attention of archaeologists; and in 1869, when the lecturer was on the island, with an agent of the Berlin museum, he witnessed the sale of everything that had been brought to light up to that time. But Di Cesnola continued his excavations after that; and in the winter of 1869 to 1870, he began work on the site of the ancient city of Solgos, discovered the Temple of Venus, and brought to light the most important collection of statuary yet found.

The way in which the city of New York came to secure so great a prize was as follows. It was first offered to Boston, and then transferred to London with a view to its acquisition by the British Museum. But Mr. Newton, the head of that institution, was unwilling to accept it under the conditions of the sale: namely, that it should retain the name of Di Cesnola, and that it should be kept intact. As there was a mortgage on the collection, Mr. Newton expected to obtain it on his own terms by delaying his decision until the day of the sale; but he was baffled in this by Di Cesnola, who grew tired of the whole business, and sold the collection to Mr. John Taylor Johnson, of New York, for \$40,000.

The two principal features of the collection are its ugliness and the confusion it is likely to leave in the mind of the spectator. This confusion will disappear when we study the position and history of Cyprus with a view to what we may expect to find there.

The island of Cyprus is only 150 miles distant from the Euphrates, that is to say, from the great Assyrian empire of Babylon and Nineveh. The nearest neighbors were the Phœnicians of Tyre, a great commercial nation, who had sailed as far as Britain, B.C. 1300. They first colonized Cyprus as far back as B.C. 1800 or 2000. Then the island passed successively under the dominion of the Egyptians, the Assyrians, the Persians, the Greeks and the Romans. As we do not know of any Phœnician art, the first to occupy our attention is the Egyptian. The characteristics of Egyptian art are evident in the temple of Ipsamboul. There we

see the sculpture as an auxiliary of architecture. The statues are not free, but attached to the walls. The artists seem also controlled by the principle that their work should adapt itself to the material of which it is made, in other words, that a stone statue should be stony. Lastly, their sculpture, like all art, reflects the spirit of the people. The great characteristic of the Egyptian people was their sentiment of eternity. All their works show its imprint, either by their colossal nature or by other attempts at conferring durability. We notice it in the pyramids, the tombs of their kings, in the embalming of mummies, and in their statuary. Here everything is of a fixed type, from which the individual artist may not vary. Hence we find, in all Egyptian statues, the same monotonous expression, the same conventional breadth of shoulder, the same head dress. A statue from Cyprus, which exhibits the above characteristics, is consequently pronounced Egyptian. Its date would therefore be between B.C. 1440 and the end of the twelfth century B.C., the period of Egyptian ascendancy in Cyprus.

We next find Cyprus as a part of the great Assyrian empire, and the sculpture of that period may be expected to exhibit Assyrian peculiarities. What these are appears in a representation of the winged bulls of Nineveh, taken from the Assyrian Court in the Crystal Palace, London. In the Assyrian empire, where mind was held in as much esteem as force, we find curious combinations of human and animal figures, made still more subservient to architecture than the Egyptian; for they are all in relief. There are no free figures. The Assyrian statues found at Cyprus are all distinguished by their helmets, their beards, and the peculiar simple drapery.

When Nebuchadnezzar destroyed Tyre, in 571 B.C., he crippled the power of the Phœnicians in Cyprus as elsewhere, and gave the Greeks a chance to gain a firm foothold on the island. With their increasing influence, the art of the Greeks began to flourish. There is a fine specimen of it which is easily recognized to be a statue of Hercules by the knotted club and the lion's skin. The head of the lion forms the head dress of the statue. The teeth and upper jaw form a kind of crown on its forehead, and the lower jaw is divided into two parts, one over each cheek. The face resembles that of the native Cypriote type of the present day, and leads us to conclude that its sculptor was a Cypriote. This statue is one of the most valuable of the collection, and would bring about ten thousand dollars.

The next period in the history of Cyprus is again one of Egyptian ascendancy; and the statues of this time, although still Assyrian, show the influence of Egyptian art. One specimen exhibits the Assyrian helmet, beard, and drapery, but also the conventional breadth of shoulder peculiar to the Egyptian statues.

After this the faces and drapery of the statues become more and more Grecian. In one figure the high priest of Venus, holding in his hand the dove sacred to the goddess and a patera or cup for libations, exhibits the peculiar zigzag character of Greek drapery. Originally they first carved their statues in wood, and then dressed them up. The angular nature which their first crude attempts had was afterwards copied in stone and became consecrated by usage. Observe the Assyrian helmet and beard and the Cypriote type of face. It is a curious and instructive fact that all these varieties of statues were found together in the same temple; for it shows us the gradual development of Greek art from Eastern art. One specimen is the most perfect example of Greek art in the collection; and it is not forty years removed from the date of the finest specimens of sculpture Greece has ever produced. The statue of the Discus Thrower shows indeed a giant step in advance; but it was very long before the development was reached. For five hundred years the Greeks were, like ourselves, too busy making money to have any art of their own. When we, in our brown stone fronts, etc., imitate some of the least desirable features of ancient art, and thus expose ourselves to criticism, we may point to the Greeks as imitators before us. The discus thrower just referred to dates not 150 years after the statue of Hercules.

After the Persian wars, when Cyrus had taken Babylon, and Cambyses conquered Egypt, the Phœnicians, who were the allies of the Persians, again flourished in Cyprus. Then the faces of the statues assume the semitic type, but otherwise preserve Greek characteristics. A figure in which the drapery is very carefully executed shows the peculiar ribbed woolen undergarment, peculiar to later Greek statues.

To prove that the statues shown were not the representatives of merely provincial but of true Greek art at different periods, the lecturer threw upon the screen a picture of statues from the Acropolis at Athens, and pointed out the same characteristics in them.

After the conquests of Alexander, Greek art rapidly declined, and we find portraits instead of ideal faces and figures. The Greeks were spread over too large a territory and formed too small a fraction of its inhabitants to maintain the ascendancy of their taste. They were diluted too much by the barbarians. The same cause operated unfavorably to the development of Roman art. There was not enough Roman blood in their vast empire to produce anything truly national.

The temple in which so many valuable objects were found was 60 feet long and 30 feet wide. It was built of mud bricks, 5 feet high and 2 feet thick, dried in the sun, and had a wooden roof. In the course of time the bricks crumbled, the roof rotted away, the space between the statues was filled up, and other debris accumulated above it.

C. F. K.

LINING metal for axle boxes: Tin 24 parts, copper 4, antimony 8. Melt together, and add 24 parts more tin.

#### Trombes.

A good deal of attention has of late been given by meteorologists to the whirling atmospheric movements denominated *trombes*. That these *trombes* are of electrical origin has been suspected from the very beginning of electrical science, and in last century experiments were made by way of imitating them on a small scale. Between two metallic plates, the upper of which was electrified, while the lower was connected to earth, various easily movable substances were brought. Water was raised in form of a cone; bran was lifted so as to form a pillar, than scattered in a whirl. In such experiments, however, the phenomenon can only be observed momentarily; the cone or column, if indeed produced, immediately disappears through the scattering of its component particles.

In a recent communication to the Berlin Academy, M. Holtz has described an apparatus by which this interesting phenomenon can be produced with greater certainty, and observed for any length of time. The arrangement consists of a cylindrical glass vessel about 8 inches high, 6 inches wide, and  $\frac{1}{2}$  or  $\frac{1}{3}$  inch thickness of side. It has a perforation in the middle of the bottom; this is filled with tinfoil, and closed on both sides (above and below) with two large plates of tinfoil. In the middle of the glass vessel hangs a hollow, flat-pressed, metallic ball,  $\frac{1}{2}$  inch in thickness, and 4 inches in diameter. The suspending piece consists of two metallic tubes, one movable in the other; the upper one is connected with the conductor of an electric machine.

If now various easily movable substances, pulverulent, and not very good conductors, be introduced into the vessel—so much of them as will be sufficient to cover the inner plate of tinfoil  $\frac{1}{2}$  to  $\frac{1}{3}$  inch—then, as soon as the machine is put into action, and the second conductor connected to earth, the substances are thrown into violent motion between the two opposite electric surfaces. With sand, however, or similar materials, no determinate cone or column formation is distinguishable. But with substances of better conduction and coarser structure, such as bran or sawdust, there are constantly formed, through the deposition of new portions, large cones and perfect columns, from which, however, the stormy, whirling, and progressive motion is absent.

M. Holtz obtained a phenomenon much more similar to the natural *trombes* when he used a liquid instead of powder—especially turpentine or olive oil—and gave the lower electrode a pointed form by adding a column of wood, this substance being taken to avoid the passing of sparks. The vessel was filled with liquid up to  $\frac{1}{2}$  inch above the point, and the interval between the metallic disk and the liquid was regulated according to the tension of the electricity.

"If we now bring the machine into action," says M. Holtz, "we observe, first, at the surface of the liquid a slight curling, and presently it tends to rise up the sides of the vessel in a peculiar vibratory motion. Very soon there is a stronger undulation, and a middle cone is formed, which gradually increases; and so long as it does not reach the metallic body, it flies off in minute dancing droplets. If, on the other hand, the cone has become a column, the liquid moves from the middle of the metallic surface to the border, and there falls down at several parts in the form of thinner columns, which, differently from the middle one, have their large bases above. Often, too, the rising stream parts into several of similar form, each of which follows its own path towards the middle part of the disk, and thence toward the edge, where, again, it branches into several descending streams. The liquid also frequently arises simultaneously at various parts, so that, sometimes, reckoning the downward streams, one may count more than twenty distinct columns; and all these columns are in constantly progressive and whirling motion."

M. Holtz calls attention to the circumstance that, in the formation in question, no difference was observable between negative and positive electricity; only the motion was more violent when the metallic disk was negatively electrified.

That the agreement between the artificial and the natural *trombe* is not absolute is, of course, evident from the circumstance that in the one case we have a closed space, with walls probably not without electric tension, as against unbounded space in Nature; and the formation occurs in Nature between movable surfaces, whereas in the experiment it is between fixed surfaces.

#### New York Academy of Sciences.

At a meeting of the New York Academy of Sciences, recently held at 64 Madison avenue, a section of biology was organized. This section will meet on the first Monday evening of each month, and to it will be referred all papers on zoölogy, botany, entomology, ethnology, anthropology, and kindred subjects. Professor E. H. Day, of the New York Normal College, was elected chairman of this section, and Dr. Heinzmann secretary. It is proposed to form field parties and make frequent excursions to the suburbs, as soon as the season permits of botanizing and fly catching. As the meetings of the Academy are public, those of our readers who are interested in plants and insects will do well to attend, bringing with them any curiosities they may chance to find.

#### Improved Zinc White.

According to a recent report of the Austrian Chemical Society, M. Orr produces a very beautiful zinc white by the following process: Sulphuret of raw barium is washed, and the liquid obtained is mixed with equal quantities of chloride and sulphate of zinc. The precipitate is collected, pressed, and dried. It is then heated on a hearth, and, while hot, is thrown in cold water. This last treatment produces a mass of great density, and the material, after washing and grinding, is of great purity and whiteness.