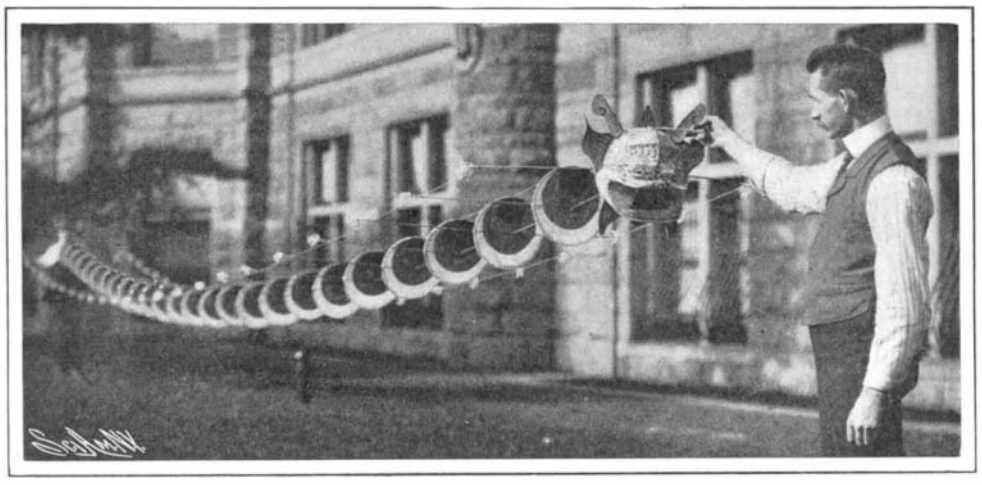
PICTURESQUE CHINESE KITES.

BY WALTER L. BEASLEY.

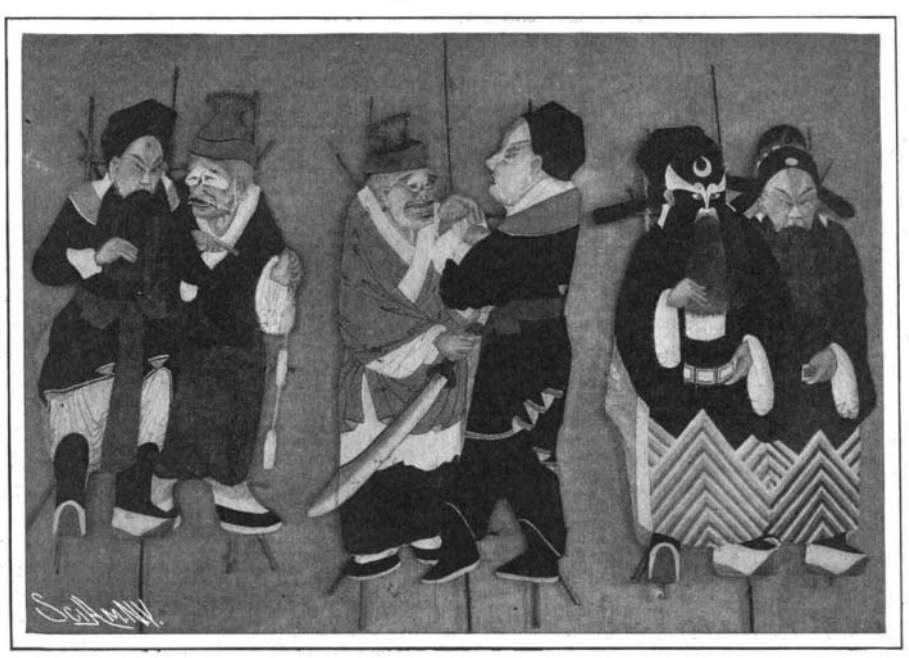
The new Chinese exhibition now being installed and arranged for early exhibition in the American Museum of Natural History, contains many novel and extremely interesting objects, quite new to the eyes of the Occident. To the liberality of Jacob H. Schiff, and a few other friends of the Museum, among them Mr. Morris K. Jesup, the present exhibit is due. The field work was intrusted to Dr. Berthold Laufer, who had previously carried on Eastern researches for the Museum among the Amur River tribes of Siberia and the island of Sakhalien in the Okotsk Sea. One portion of the collection is devoted to the popular amusements of the country. The most curious and striking specimens of this section are a varied series of picture kites, unusually picturesque in shape and ornamentation. The kites are wonderful specimens in their way, and portray a deal of ingenuity, especially their love of art and decoration, which runs through the whole life of the Chinese people, from their highest creations to the most commonplace objects of amusement. The kites were obtained in the vicinity of Peking, and they represent one of the leading outdoor diversions of the sons of both mandarins and nobles, as well as the native population. In China kite-flying is a national pastime. They are flown on certain holidays, one of the most popular being the festival of Ascending on High, occurring on the ninth day of the ninth month. On this occasion the hills and open country are lined with great processions of kite-fliers, both young and old, who devote the whole day to this sport. The universal use of the kite is not looked upon as a form of amusement alone, but has a sort of religious interest connected with it, and is regarded as symbolic of the human soul, which is likened unto a bird in flight. Each particular kite, therefore, has its meaning and conveys some emblematic idea. A story or legend is suggested, and some famous god or warrior's face is usually depicted. The likenesses of various animals and insects, more or less believed to be creatures of good luck rather than of evil portent, such as frogs, fishes, fireflies, owls, and butterflies, form the design of most of them. A great number, however, are constructed in double-like fashion, representing theatrical scenes and heroes of their ancient drama. Two of these portrait kites are shown in the accompanying illustrations. In most cases, excepting those of the women, the faces are covered with long-bearded, grotesque masks. A pair of boy-wrestlers in action and a typical Chinese maiden linked by the side of a figure having a ferocious animal head, evidently an Oriental version of Beauty and the Beast, form some of the curious shapes.

Probably the most wonderful and ingenious achievement of the Chinese kitemaker is the one designed to be a counterpart of the great Flying Dragon. This is unquestionably the longest and most fantastic amusement device that has ever been constructed for aerial flight. From head to tail it measures nearly forty feet, and is made to fold up, accordion-like. The fierce large head of the dragon, so famous in Chinese mythology, having long protruding horns, huge eyes, and gaping mouth, forms the front of the kite. Extending from head to end, and constituting the body portion, are a series of bamboo sticks, running crosswise, to the center of which are fastened twenty-five or more pasteboard disks, a foot in diameter. These are painted in circles of black, red, yellow, and white, representing the all-seeing eyes of the mighty dragon. A tail portion, of narrow silk strips, is arranged to the last piece of bamboo. By a mechanical contrivance, the curved pieces of pasteboard forming the eyes are made to revolve by the wind while the kite is being flown. Seen in the air, with its serpentine-like motion, its huge, glaring eyes, swiftly twirling in their sockets, the effect is said to be astonishingly realistic, producing an awe-inspiring scene, to the Chinese mind, at least, of the powerful demon of the Upper World. While being flown, a cord is attached to three or more points of its length, in order to keep it under control. In strong winds, several men are required to hold the reel. Undoubtedly we have here one of the first and most ancient patterns of flying-machines, thousands of years old, which modern investigators have utilized and brought to almost successful perfection. Dr. Stewart Cullen, of the Brooklyn Institute of Arts and Sciences, a recognized authority on games and amusements of the East, states that the first invention and origin of the kite is attributed to a Chinese general named Han Sin, who in the second century B. C., while engaged in besieging the fortifications of Kao Tsu, the founder of the Han dynasty, sent up a kite to measure the distance from his camp to the palace, which he had planned to enter by digging a tunnel, through which his army would come out about the center of the palace courtyard. Japan and Corea also imitate their Chinese neighbors in kite-flying, a custom which was probably borrowed and introduced from the latter country, though their kites are not nearly so artistic and fanciful in design as those of the Chinese. The Japanese are likewise ardent lovers of kite-flying, and come next to the Chinese in the variety of forms they employ. Certain days are set apart for kite-flying in Japan, varying in different localities. In one of the current stories of Japan a famous kite episode is recorded. In the sixteenth century a noted robber and bandit, Ishikawa Goemen, boldly tried to steal the celebrated Golden Fish surmounting the castle of Nagaya, by soaring up one stormy night by the aid of a large kite. Since then the flying of kites of an unusual size has been prohibited in the province of Owari. One of the peculiar sports which has been evolved out of kite-flying, and which is extensively practised in Japan and Corea, and to a limited degree in China, is that of kite-fighting. For this aerial warfare, silk cords or strings are used, which have been dipped their entire length in fish glue and a preparation of powdered glass or porcelain. The kites are sent up, and the moment the strings become crossed the battle begins. The manipulators must let out their lines, and the one that becomes tense is cut through at once. When half a dozen or more become entangled, the sport lasts nearly a day. Money is frequently wagered and special matches arranged by experts in kite-fighting. Besides the wide array of unique picture kites here shown and described, the new Chinese collection contains rich examples of the best *cloisonné* work. Numerous native paintings and drawings, illustrating their religious belief and worship, medical methods, the art of printing and bookmaking, together with a thousand or more volumes in Chinese script on all subjects, were obtained. When fully completed and installed the exhibit will be the largest and most comprehensive in this country, covering as it will nearly the whole range of Chinese life and industries. It is the ultimate hope and aim of the committee that the present collection should but mark the beginning of an exhaustive educational one, to be increased in the future by additions from all the other Asiatic countries, which would thoroughly represent the whole domain of their various cultures. The installing of such a collection, with its unequaled opportunities for practical research and study, would, it is thought, give an impetus to Columbia University which might lead to the establishment of an Oriental School, like those of London, Berlin, Leyden, St. Petersburg, and Paris, in which students could be trained for the diplomatic and consular service, and where business men, intending to locate in the Far East, could be made thoroughly acquainted with the products, needs, and commercial possibilities of these lands. The chair of Chinese recently inaugurated at Columbia, under Prof. Frederick Hirth, is the first successful step in this direction.



A Chinese Dragon Kite Forty Feet Long.

The Wrestlers—A Decorative Design on a Chinese Kite.



The Captive Maiden—A Scene Painted on a Chinese Kite.

PICTURESQUE CHINESE KITES.

STAFF—ITS USE AND TREATMENT.

BY J. S. CRAWFORD.

The crest of Art Hill in the Exposition grounds at St. Louis commands a view of the general Exposition buildings. These buildings are finished in staff. The pedestals, columns, capitals, pilasters, curtain-walls, friezes, pediments, arches, masks, figures, and statuary groups are molded of that material.

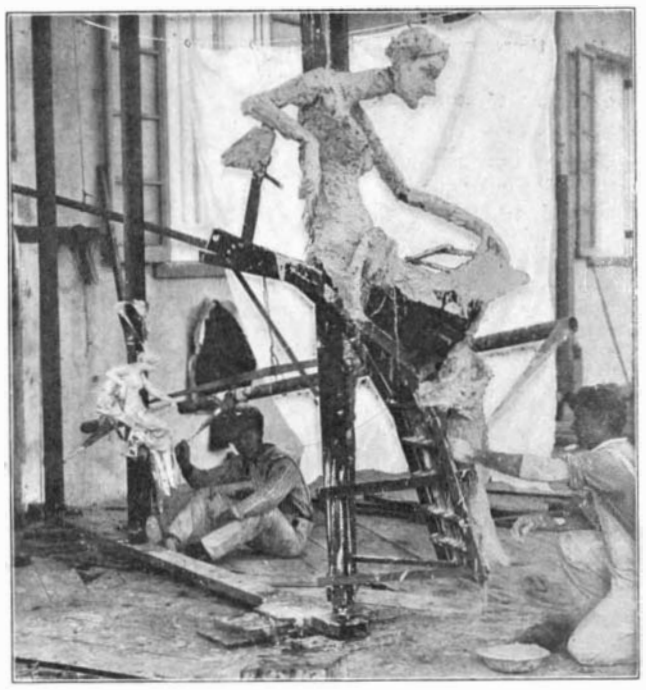
From the view above indicated the facades, architectural members and enrichments look like stone. They appear strong, solid, and permanent. This view from the hill has been designed to give the buildings perspective and emphasize their massiveness. The tints harmonize with stone colors. Like all pleasing constructions, the elevations are simple and stately; they please by the absence of fussy details; they impress by the restraints of dignity. Many times I have gone upon Art Hill with delegations in which were Congressmen, State officers, commissioners, and men high in the professions—all agree that strength, beauty, and dignity are the predominating features of these Exposition buildings.

Yet they are temporary. At best they are expected to last little more than a half-dozen years.

When I concluded to write this article on staff, it did not occur to

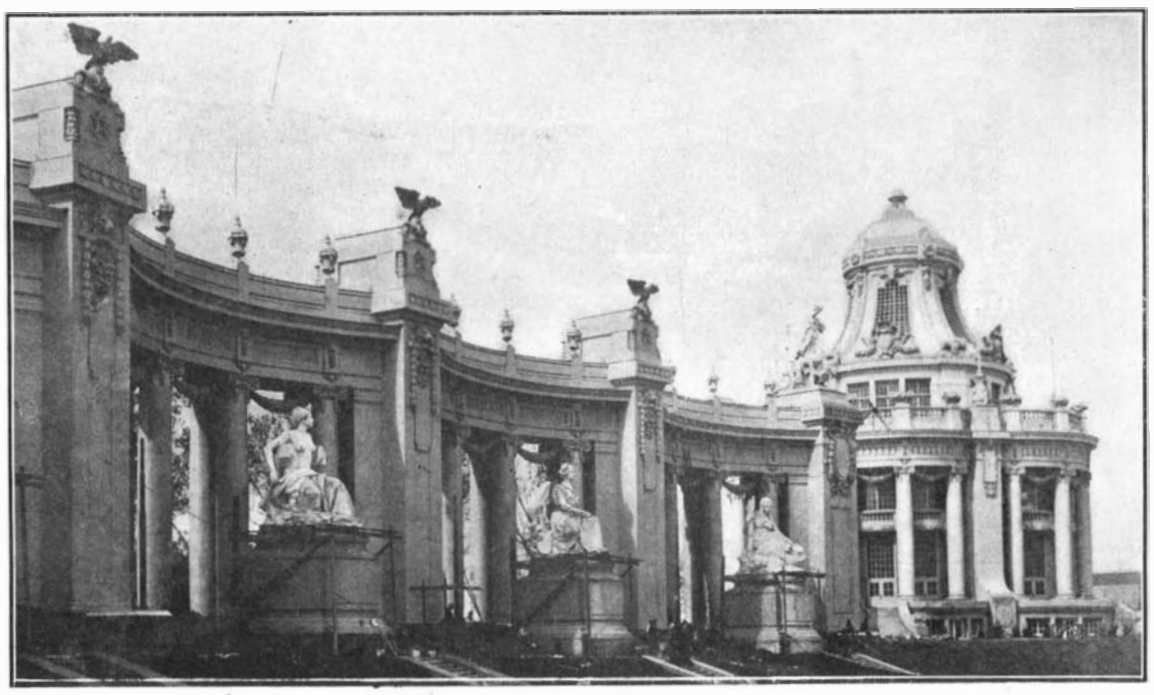
Detail of Portico.

How Figures are Assembled and Spiked in Place.



The Pointing Machine. Model to the Left, Artisan Setting Nails to the Pointer at the Right.

A Completed Figure Ready for Installation.



The Colonnade of Statues.

An Ionic Colonnade Veneered with Staff.

STAFF—ITS USE AND TREATMENT AT THE ST. LOUIS EXPOSITION.

me that there would be the least difficulty in obtaining facts. Here were a half-dozen shops. Here were the contractors, the modelers, the molders, the installers and hangers; some had operated in staff at Chicago, Omaha, Paris, and Buffalo. But I soon found that their statements did not agree. Some said that Portland cement mixed with the staff made a composition stronger and better than staff alone; others said that cement and staff were incompatibles—that the mixture would not form adhesive plaster at all; some said that marble-dust was mixed with the best grades of staff; others never heard of marble dust. Most of the Italian workers claim to have secret processes for compounding the molds and releasing the cast from the mold; Americans claim that the best treatment is known alike to all skilled craftsmen in the art. Some said that the first staff was used on the Chicago Exposition buildings in 1893; others insisted that the ancients had plastered their houses very much in the way that St. Louis mechanics are doing to-day—that mummy-cases were made of staff. These staff-workers did not even agree as to the origin of the name. One pleasant fiction ran that W. D. Richardson, superintendent of staff-work at the Columbian Exposition, presented some specimens of his work to the chief architect of the Columbian Exposition buildings and the architect was so much pleased that he adopted Richardson's suggestion, saying: "This is the *staff* upon which we shall lean;" that the phrase was catching, and that the name crept into general use.

In the main these contradictions do not grow out of a purpose to deceive. The industry is so new in our country and its possibility so great that all sorts of theories have become current. No standards have been established and there are no printed American authorities. Staff workmen are enthusiastic and their imaginations do not always subserve their judgments.

Magazine writers have apparently overlooked the subject and there is scarcely anything in the elementary or periodical literature of the country treating of staff. William Millar, a London plasterer, printed a book in 1891 on "Plastering, Plain and Decorative," which furnishes some valuable subsidiary matter. This is the only English authority I could find. Watching the molding operations, however, I became able to reconcile a certain line of statements so that I ought to be able to give the essential facts relating to staff and its treatment.

Suppose that one hundred spread-eagles of colossal size are wanted. First, Missouri yellow clay is ground and tempered to the consistency of putty when ready for the glazier. The modeler shapes this clay in all details exactly as he wants the eagles. This work requires an artist. The model is kept free from cracks and toughened by moisture.

The next thing is to get a flexible mold which conforms in every particular to the details of the eagle. From this mold the one hundred birds will be cast. This mold is made of gelatin. It is one or two inches thick, cohesive, tough, and flexible. It is mobile, so that parts of the cast which cut under may be released. It may be bent and handled with little danger of breaking.

How shall we cast this mold?

First, overlay the model with a coat of clay one or two inches thick. Then overlay the coat of clay with a shell of plaster-of-Paris four or five inches thick. This "shell" may be cast in sections, or it may be cast whole and cut through to the overlay with a saw, then taken down in sections. The overlay of clay is then taken down; the model now stands alone. This model is oiled or greased. The inner surface of the shell is likewise oiled or greased, the shell replaced, and the sections keyed together and locked. The mold and model are held in their relative positions by a shore underneath and small posts called struts on the sides. There is now a vacant space between the shell and the model—the space before occupied by the clay. Through a small opening in the top this space is filled with ladles of melted gelatin, which soon sets. The shell is again taken down, the gelatin cut in sections coinciding with the shell and removed from the model. Each part is placed in its counterpart of the shell, and when these parts are approximated the mold is complete. The oil prevents the gelatin from sticking to either the shell or the mold. Alum water applied to the mold hardens its surface, causing the plaster to set more quickly.

From this mold twenty or twenty-five plaster-of-Paris eagles may be cast. As soon as the mold shows signs of weakening the gelatin is melted again and molded again. Ten eagles may be cast a day, and these casts ought to season two or three days before installation. So that giving time for making and renewing the molds it would be two weeks after the model is finished before the figures of these colossal birds would perch along the sky-line of a colonnade or building.

A discriminating mind will at once see the value of gelatin, which is a superior kind of glue, for molding ornamental figures. An intractable material such as wood or wax would not allow the "undercuts" to be withdrawn—no elaborate figure could be duplicated in the same mold. Gelatin (being tough, flexible, and mobile) cheapens, diversifies, and enriches the reliefs of the decoration.

The gelatin mold was invented by Mons. H. Vincent in London in 1850. The great exposition of 1851 popularized the process. Italians, always expert in terra cotta and the plastic arts, were quick to adopt it, and most of the men who follow exposition staff-work in this country are Italians. However, there is no special secret about the process of molding, and when a strike is threatened there is little difficulty in finding Americans or Germans who soon pick up the work. John Pianta, it is claimed, applied for a patent for a glue mold in the United States twenty-five years ago—a fact which no doubt tended to confirm Italians in the notion that they could monopolize the work. Some minor improvements have been introduced, such as using shellac to season and harden the surface of the clay model, stop the suction, and prevent adhesion. This gelatin searches out the minutest recesses in the model; it will reflect the grain in tanned skins and a day's growth of the human beard.

Of what are these eagles made?

Gypsum is the sulphate of lime. Gypsum rock is mined at Fort Dodge, Iowa; Blue Rapids, Kansas, and different points in Michigan. This rock is crushed and reduced in a grinder until it will pass through a burr-mill which reduces it to an impalpable flour. It is then cooked for two hours in kettles which hold eight or ten tons each. This cooking process gives it the chemical properties of stucco. The flour is commercially known as plaster-of-Paris. Out of this plaster alabaster is made.

A solution of glue retards the setting of mortar, giving the workmen more time to manipulate the plaster. A cast of simple plaster-of-Paris may be sawed, chiseled, whittled, and fitted, but it will not stand hammering or nailing. It will break and shatter. It is brittle and needs a binder.

Under the patronage of Owen Jones, the famous author of "The Grammar of Ornament," M. Leonard Alexander Desachy, a French modeler, in 1856, took out letters patent in London for a fibrous plaster. The Frenchman failed financially, but his method was so successful that at the Paris Exposition of 1878 panels forty feet square were shown made of fibrous plaster. This work for the first time was called "staff." The embellishments of the panel were called "*chassis-en-staff*." These panels were fastened with nails or screws; the enrichments were planted in the same manner. At this exposition some of the arches along the "Streets of All Nations" were made of staff. Where it was not possible to mold the sections *in situ*, they were nailed in place. Tow was used as a binder and the process gradually spread among engineers, mechanics, and workmen everywhere.

It is claimed that over 150,000 square yards of the fibrous plaster were used at the Columbian Exposition. For interior decoration it is as permanent as adamant. It is used to restore old ceilings; to build new centerpieces, pilasters, columns, medallions, running friezes and borders; to mold original and free-hand pieces, etc. It makes fine stage properties—great cannon, temples, images, stone ledges, and the like. They are cast around a core to make them light and cheap. It was used in the interior decoration of the new opera house in Paris, and a replica of Michael Angelo's "Moses" was made of staff in one of the Italian churches and transported to the museum in South Kensington.

The ordinary fibrous plaster is made of plaster-of-Paris and Manila fiber. Desachy used a coarse canvas called "scrim." At the Columbian Exposition burlap was largely used, at a cost of twelve cents a pound. In Mexico a species of cactus—the same from which pulque is made—furnishes a good fiber, and the coarse tow of New Zealand flax ranks high. I am told that some kinds of sea-grass and excelsior have been used successfully. This binder must be rather loose and coarse to allow the plaster to percolate and to give a surface for adhesion. It must be strong and well teased to give the cast uniform resistance. Mr. Joseph Eastman is perhaps the first contractor who used the unwoven fiber in this country, and Mr. Leo Bonet the first to exploit what is called staff-work in America.

Unmixed with fiber, a thin coating of mortar called "firsts" is first introduced into the mold to give a smooth, finished appearance. As soon as the firsts become tacky the "seconds" are introduced with relatively large quantities of fiber. Hundreds and hundreds of tons of this fiber from Manila have been used in the World's Fair buildings at St. Louis, at a cost not to exceed four cents a pound. Most of the casts are made in sections with open, unfinished backs. The mortar is banked against the mold as though the cast were hollow; strips of scantling with ends projecting are hanked in with the fiber and imbedded along the back of the cast. These ends make good handles for carrying the figures and the strips give additional strength to the work. Molders become very skilled in judging the amount of mortar necessary to fill one of these sections. I have frequently seen them gage the amount so exactly that not a quart of the material was left. And they appear to know just how fast to work the gaging before it becomes hard and refractory.

If it is sought to reinforce the fireproof qualities of staff English workmen introduce slag and breeze with the fiber. It seems that a few years ago a music hall in Oxford veneered with staff burned and gave the English architects an opportunity to determine the fire-resisting qualities of various retarding ingredients. Staff and slag stood the test.

Staff is splendidly adapted for all kinds of relief ornamentation. It readily adapts itself to arcs, ovals, scrolls, or irregular, free-hand figures. Its lines are not hard and studied like those of brick. They are soft, swimming, and pleasing.

Like the Bath stone in England, it may be put on in slabs to imitate heavy ashlars. Its cost is about one-third that of wood. The contract price of the Manufactures Building was $720,000; of that sum $165,000 was paid for the staff-work. This is a fair illustration of the proportional cost. The gelatin mold increased its production; the fiber increased its use.

Staff is well-nigh fireproof. Frost does not hurt it. Rain has little effect upon it. A drip injures it. Yet as a veneer for the ordinary Exposition building it lasts scarcely ten years. Why? Ordinarily these buildings have inadequate foundations. They settle and force cracks in the walls. Much of the plane surface is plastered on Burkitt-Hall sheeting, one-half inch pine, which costs about $16 a thousand. This sheeting is plowed with a tool like that used for matching flooring, the grooves running an inch or two apart. This sheeting swells in wet weather and shrinks in dry so that the clinches are broken and the plaster scales off. When anchored to brick buildings or spread on expanded lath, staff will doubtless prove to be a serviceable outside finish, easily repaired and moderate in cost. But its fitness for a permanent finish is just beginning to receive the attention of American builders. Before we shall know its real value we must await their verdict.

Besides the ornate decorations of the Exposition buildings done by the contractors, a half million dollars is being spent under the supervision of the Chief of Sculpture, Mr. Karl Bitter. In this department of the Fine Arts no less than six hunded groups and figures will be executed. Under methods prevailing twenty years ago it would have been impossible to do this work in the limited time or with twice the sum of money appropriated. One device alone, the pointing machine, has worked a saving of more than $300,000. This machine was invented by Mr. W. H. Pain and operates on the principle of the wood-carving frame used in the Pullman shops, and no doubt evolved from the pantograph. The model is, of course, made in the studio of the artist commissioned to produce it. This model is conveyed to an enlarging shop, of which there are two—one at Hoboken, N. J., and the other in the Education building. One arm of the pointing machine follows the reliefs of the model while the long arm indicates on a wooden frame the height of the corresponding relief on the enlarged work. Nails and slender spikes are driven into the frame just far enough to mark the height indicated by the pointer. Staff heavily bound with fiber is laid through this arrangement of nails until the heads are barely covered. With a little skill and practice the reliefs and surfaces of the original are enlarged to any size required. One group here known as the Center Cascades weighs over twenty tons and is built up in twenty sections. Many of these groups weigh five or six tons, and the statue of "Peace," by Karl Bitter, is a female figure sixteen feet high. The workmen in these enlarging shops get from 70 to 90 cents an hour.

Closely related to staff is pargeting—using a die on plastic ceilings to indent the ornamentation—a method which superseded hand-carved stucco.

Of course, molded work is cheaper and more diversified. But the relations of staff to the older methods of decoration is an interesting study, one upon which I shall not enter further than to say that plaster-of-Paris cannot be used with Portland cement. Miles of buildings in Paris and London are veneered and embellished with cement alone, but never in composition with staff; they are incompatibles.

One of the greatest enemies and causes of trouble to any first-class packing is water in cylinders, which, when it occurs, demoralizes the packing. Strange to say, no metallic packing has been designed which will give first-class results as a water packing—the water rods of pumps, for instance. When first applied they usually work with fair success, but soon commence to leak and continue doing so. Also no thoroughly satisfactory packing has been invented and used for expansion joints. There is quite a large field for investigation in this direction.

Charles T. Yerkes is the authority for the statement that the London underground system is now half completed, and that it will be entirely finished in about five years. The section from Baker Street to Waterloo will be open within a year.