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CHANTILLY CASTLE.

IN every country there are a certain number of residences—palaces or castles—which are known to all, whose names are bound up with the nation's story, and which are representative, if I may use the term, of the different periods of civilization through which they have come down to us. The picturesque outlines of their towers, balustrades and terraces illustrate and embellish the pages of history. They tell us of the private life of those who for a short while have occupied the world's stage, showing us what were those persons' ideas of comfort and luxury, their artistic tastes, how they built their habitations and laid out their parks and gardens. Thus these edifices belong to the history of architecture, using this word not in its strict meaning of construction, but in that of mother and protectress of all the plastic arts. They evoke a vanished past, a past, however, of which we are the outcome. One cannot look without emotion upon such ancient and historical edifices as those at Blois, Fontainebleau, Versailles and Chantilly, not to mention others.

This article proposes to deal with Chantilly Castle, in order to show the parts it has successively played in French history during the last four hundred years. Chantilly was never a royal residence. In the sixteenth century it belonged to one of the leading families of France, the Montmorencys, and from the seventeenth to a younger branch of the royal family, viz., the Condé branch. Its history is as dramatic as the history of France itself, being, in fact, an epitome of the latter. Chantilly has gone through a continual succession of ups and downs. At the advent of each new period the old forms have been destroyed to give place to new ones. The Renaissance would not tolerate the mediæval keep, although it retained the picturesque aspect thereof—in fact, the seventeenth century was even more destructive than the Revolution. We shall see how a princely family gathered together in this castle,

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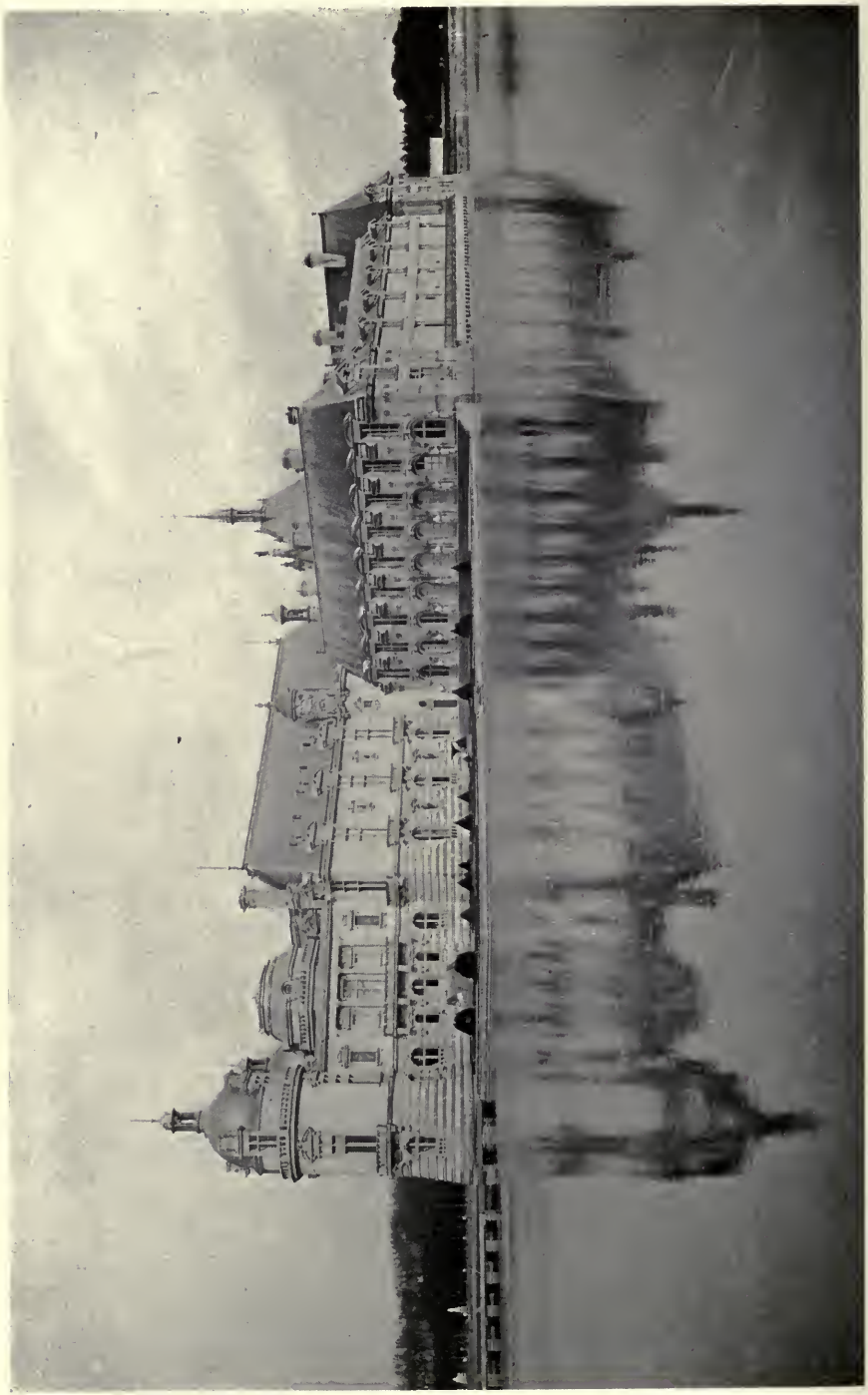

FIG. 1. GENERAL VIEW OF CHANTILLY CASTLE.

in the course of two centuries, a rich store of art treasures, and how the Revolution came and in two short years dispersed the collections, sold the furniture and razed the Castle to the ground. Finally, after many vicissitudes, Chantilly was rebuilt by the Duc d'Aumale, the descendant of the Condés, and again filled with masterpieces of art. In his hands it became as splendid as it had ever been, and this time to remain so. The duke, desiring that these treasures should belong to the French nation, bequeathed Chantilly Castle to the Institute of France, to be freely accessible for all time to artists, men of science and the people at large.

Chantilly, therefore, is now a unique place. Architecturally, it has preserved an exquisite specimen of French Renaissance work —the Châtelet—whilst inside its walls it holds art collections of a truly rare interest. We shall endeavor here to revive a few of the most interesting periods in the Castle's history.

* * * * * *

Chantilly is of Roman origin. At the edge of a large forest, thirty miles north of Paris, the Romans established a fortified post on an isolated rock standing in the middle of a marshy valley. This post was commanded by one Cantillius, whence the present name of the place. Subsequently the swamps were drained, and their waters, mingled with those of a small river, the Nonette, surround the present castle, which, like its predecessor, stands upon the rocky site chosen by the Romans. From the very gates of the castle stretch immense forests, which resound twice every week to the notes of the huntsman's horn and the bayings of hounds in chase of stag or boar.

In the fourteenth century the chateau belonged to the Boutellier family, of Senlis. It was destroyed by fire during the peasants' revolt known as the Jacquerie. At the end of that century a Chancellor of King Charles V., named Pierre d'Orgemont, bought Chantilly and rebuilt the Castle. It was the d'Orgemont family who were the real founders of the present edifice. The groundwork of the Castle has remained the same since that time. Through all the subsequent reconstructions, the foundations laid in the fourteenth century have been retained.

At that time it was an important fortress, with marshes all round, and the entrance protected by a gateway surmounted by the heads of boars and wolves. The principal keep was defended by three moats, three drawbridges and three walls. The Hundred Years' War was at its height, and English, French and Burgundians were fighting in the provinces around Paris. The Sire d'Orgemont, in

his stronghold of Chantilly, fought successfully against the garrisons of Senlis and Creil. At the close of the fifteenth century the d'Orgemont family had, as heir, only a daughter. She married Jean, second Baron de Montmorency, and by this union Chantilly entered into the possession of this house, and then into that of the Condés, with whom it was destined to remain.

The grandson of the said Jean de Montmorency and Marguerite d'Orgemont was the celebrated High Constable, Anne de Montmorency, a great soldier, and companion of François Premier and Henri II., but also, as was the fashion of the time, a classical scholar and a man of refined, artistic tastes. In his hands the old chateau lost much of its mediæval character.

The French, with Charles VIII. and François Premier at their head, had gone down into Italy and seen there the monuments erected in the course of the fifteenth century by architects who had studied those antique models with which that country was so richly strewn. Brunelleschi, Leon Battista, Alberti, Bramante, had constructed palaces and churches in a new style. The French became infatuated therewith, and on returning to their own country wanted to put into practice the rules laid down by the Italian architects. Happily, however, the revolution was not a complete one. In the country where that admirable creation, the Gothic style, originated, it was not easy to do away with the old habits at a single stroke. A compromise took place, the French adopting the antique ornamentation—columns, pilasters—but retaining the picturesque features of their own styles—the lofty roofs, the large chimneys, the high dormers, and also the general arrangement of the buildings. They did not sacrifice everything to uniformity of front, as did the Italians, but preserved a rational division of the various sections, visible from without. The staircases remained visible. Besides, they kept, for chapels, the Gothic vault. Thus it is that we have those charming examples of the Renaissance—Chambord, Blois, Chenonceaux, Saint-Germain, Fontainebleau, Chantilly—which, while conceding something to the new fashion, retain a thoroughly French stamp.

The times, too, had changed. Order had been restored to the kingdom; the powerful independent nobles had been checkmated by Louis XI.; the provinces were no longer being devastated by civil wars and the religious conflict had not yet broken out. On all sides the nobles were eager to let the air and the sunshine enter the gloomy strongholds that had come down to them from feudal times. They had large openings pierced—rows of windows reaching from the ground floor to the top, and forming a characteristic of the architecture of the period. Beautiful gardens after the Italian style were laid out around the castles.

The High Constable, Anne de Montmorency, transformed Chantilly in this manner in the first half of the sixteenth century, employing for that purpose a celebrated architect named Pierre Chambiges, son of a man who was himself a well-known architect.

It must not be supposed that in those days architects had the same social standing as they have now. In our time an architect is a gentleman—or at least one hopes so. At night he dons evening dress and dines out. He belongs to society. In the Middle Ages, however, and even during the Renaissance, the name architect was not used: he was called a mason. The difference of position is evi-

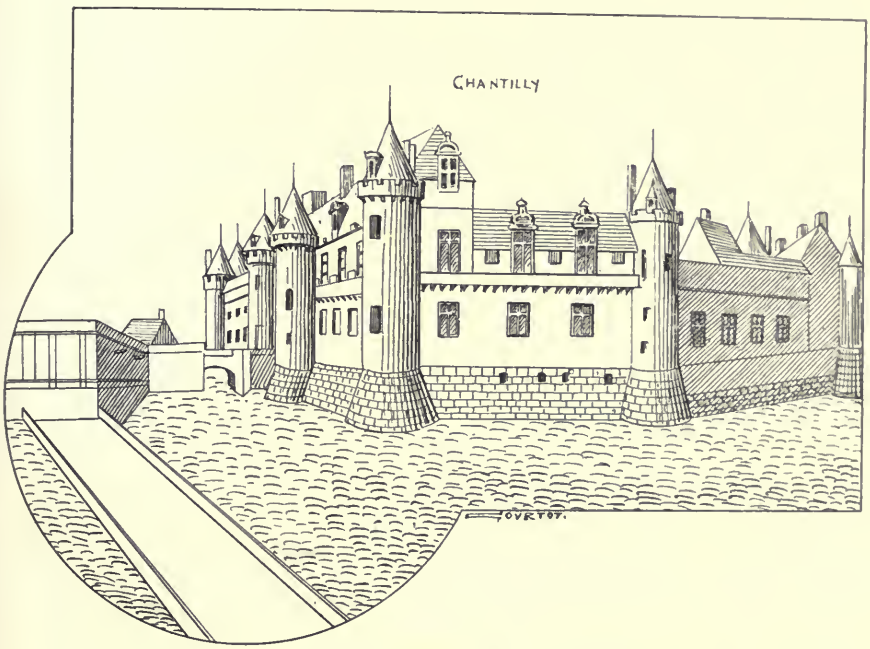

FIG. 2. CHANTILLY CASTLE AT THE TIME OF ANNE DE MONTMORENCY. From an Engraving by Du Cerceau.

dent. Pierre Chambiges, architect of the High Constable Anne de Montmorency, was one of the four master masons of the City of Paris. He worked for the king, François Premier, at Fontainebleau, Saint-Germain and La Muette. He was engaged at Chantilly for three years. Nothing now remains of his work, and for this we must blame, not the Revolution, but the seventeenth century, which could not endure the picturesque, so dear to the first Renaissance. Thus we see at Chantilly the different phases of the evolution of taste, and observe that, as I have often pointed out, the triumph of Italian ideas was, happily, very tardy in

France, and that the sixteenth century preserved its originality and its gracefulness.

Du Cerceau's work, "Les Plus Excellents bastiments de France," has an illustration, which we reproduce (Fig. 2), showing the state of Chantilly Castle as it stood in the time of the High Constable Anne, and before the Petit Château had been erected. It was no longer a mediæval keep, and yet Pierre Chambiges' work, with its many windows, was still a stronghold.

About the year 1560 High Constable Anne decided to build a small castle on an island situated alongside the rock on which stood

FIG. 3. WEST FRONT OF THE "PETIT CHATEAU."

Chantilly Castle. Jean Bullant, Architect.

the principal building. His architect for this work was Jean Bullant, who had already worked for him on the Chateau d'Ecouen. The small castle was connected with the big one by a drawbridge and a passage-way at each story. This small castle is all that now remains of the ancient Chantilly. It is one of the finest examples of the second French Renaissance—the Renaissance of Henri the Second's time—and shows a greater effort after symmetry and a taste for regularity of arrangement. One also notes there the appearance in French architecture of the Colossal Order, as is shown in Fig. 3 of this article.

The Colossal Order, which has had a not less colossal success in the world, was invented by an Italian named Palladio, who applied it to the Theatre of Vicenza. The antique orders, as is known, each commanded a story. The Greeks avoided as much as possible the superposing of stories; the Romans, on the contrary, employed it frequently, as we see in the Colosseum and other monuments: the Doric Order for the ground floor, then the Ionic, and then the Corinthian or Composite.

This arrangement was reproduced during the Renaissance. But something new was desired, something less sober, something more

FIG. 4. EAST FRONT OF THE "PETIT CHATEAU."
Chantilly Castle. Jean Bullant, Architect.

striking, and so they invented the plan of columns covering two stories at a bound and supporting the entablature. This is what is called the Colossal Order, where all the carefully studied proportions of the antique orders are changed. The Colossal Order has spread over the world. There are few public monuments in Europe or America that have not offered up in sacrifice to it, and hence it is interesting to know where it came from and what was the first building to which it was applied in France. By rare good fortune the small castle, or Châtelet, at Chantilly, escaped Man-

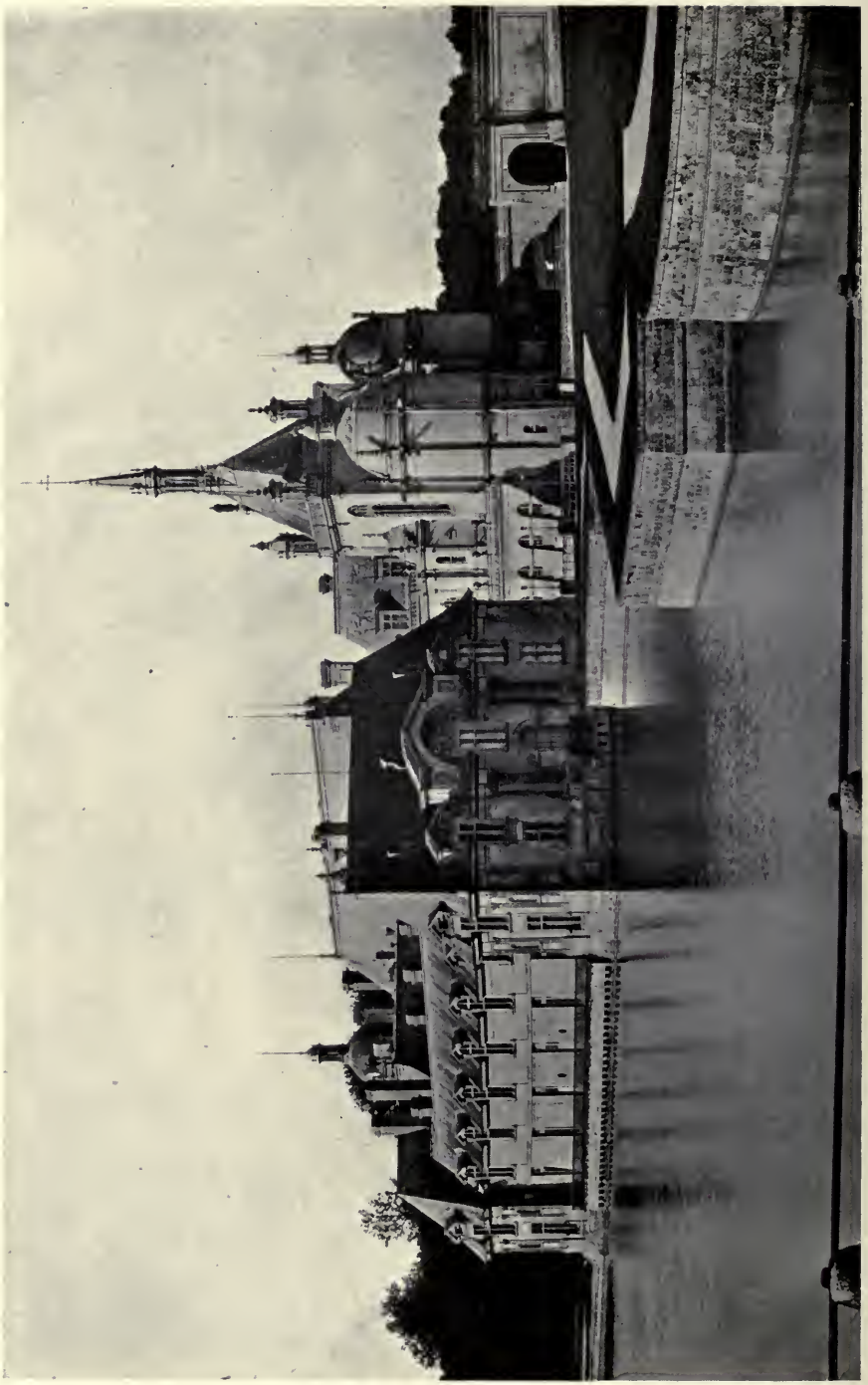

FIG. 5. THE "PETIT CHATEAU." Jean Bullant, Architect.
Chantilly Castle.

sart's restorations in the seventeenth century and the destructions of the Revolutionary period. We see it to-day exactly as Bullant built it three hundred and fifty years ago.

We give several views of the small castle, for it deserves this distinction. One figure (Fig. 3) shows the front looking on the garden called the Volière. The following is its arrangement: on the ground floor, semi-circular bays opening on to the terrace; above, high windows passing the cornice and rising dormerwise to the roof, with frontons in the form of the segment of a circle alternating with triangular ones; between the bays, pilasters rising to the entablature, regardless of the division into stories. The high roof is of handsome design, while its steep slope insures the rapid running off of the rain water. This again is in harmony with the mediæval tradition.

The south front of the Châtelet (Fig. 5) is more subdued, although Bullant keeps to the plan of windows which leap over the cornice. We are not familiar with any other examples of this. The two blocks flanking this front form an ornate outwork, with four elegant pilasters each. The sharp cut of the roof adds to the picturesqueness. As to the eastern front (Fig. 4), it is a handsome composition of the kind dear to the Renaissance. It looks now, as it did long years ago, towards the entrance of the big Castle. Bullant placed there a large projecting portico with a monumental pediment engaged in the roof and supported by pillars. Inside the tympanum two allegorical figures are holding a shield with the Montmorency arms surmounted by a helmet. Niches between the pillars are still awaiting statues to fill them. The capitals, dormer frames, brackets, cornice, pediment, all have the finest, richest decoration.

As the reader will see by the plan of Chantilly which we give (Fig. 6), the Châtelet consists of three blocks, which are now connected with the Grand Château by the grand vestibule and by the library. Formerly, the two buildings were separated by a moat filled with water.

Jean Bullant's work is a very original one, as has been remarked. It shows such imagination and such personal inspiration as remained in the architecture of the second half of the sixteenth century. I do not know of any castle or palace that resembles the Châtelet. Its conception is quite original: the Colossal Order, with windows reaching into the roof, produces a curious impression. At first sight one cannot understand what the division into stories is, although this, in every edifice in the world, is the point one recognizes before anything else, and certainly that is not an arrangement to be recommended. Nevertheless, Jean Bullant's work is a pleasing one, by its fine sense of proportion, by the ele-

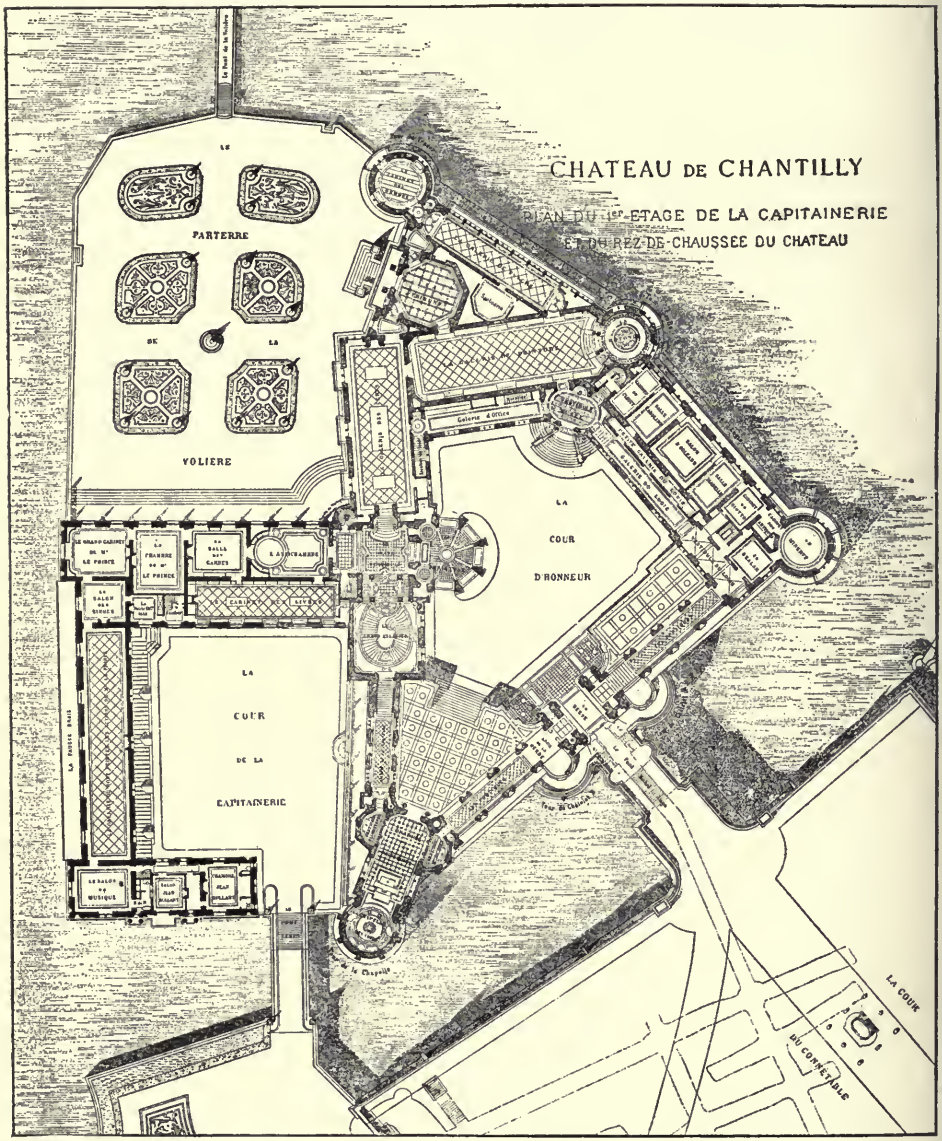

FIG. 6. PLAN OF THE FIRST FLOOR OF THE PRESENT CASTLE OF CHANTILLY.

gance of the sweep and profile of its cornice moulding, and by its decoration, at once rich and sober. It is the mingling of these qualities, rare at all periods and almost lost, we think, at the present time, that makes the small castle of Chantilly one of the best examples of French architecture.

Chantilly, in those days, was one of the finest residences in France. The High Constable, Anne de Montmorency, betook himself there to rest from the fatigues of warfare. He led the country life of a *grand seigneur*. He built a large farm house on the estate, bred stock on extensive pastures laid out in the French manner, and, in his idle hours, played tennis. He entertained freely, amongst his distinguished guests being François Premier and, later on, Henry II. Chantilly was then, as it is now, a great place for the chase: in the neighboring forests they hunted the boar and the stag.

During the religious wars of the League, Henri de Montmorency, Anne's son, took the side of King Henri IV., to whom he rendered valuable service. As a reward, he was appointed in his turn High Constable of France, and Henri, after coming to the throne, continued to be his friend. The king always called him "mon compère." He even wanted to have the High Constable's son marry Mademoiselle de Vendôme, the illegitimate daughter he had had by Gabrielle d'Estrées; but Montmorency was not willing. To have a bastard, even a royal one, enter his family, did not attract him at all; and so, without asking the king's consent, he hastened to arrange a marriage for his son with a certain Mademoiselle de Chemillé, who was eighteen years old, whereas his son was only thirteen. The marriage took place and, as was the custom in the case of such young couples, the wedded pair were parted immediately after the ceremony. Henri IV. was so angry that the High Constable dared not leave Chantilly. Several months passed. Then the king suddenly relented. The fact was that he had fallen in love with the High Constable's daughter, Charlotte Marguérite de Montmorency, who at that time was only fifteen years of age, but extremely beautiful. In order to have her always near him, the middle-aged monarch would not rest until he had married this handsome girl to his nephew, the Prince de Condé, who, however, was fonder of the chase than of ladies. This marriage took place, but the Prince de Condé proved to be a less complaisant husband than Henri IV. had counted upon. As soon as he perceived the king's feeling for his wife, he at once quitted the country, taking her with him, and did not return until after Henri's death.

As to the second Henri de Montmorency, son of the High Constable and himself a field marshal, he took part in the struggle against Richelieu, allied himself to Gaston of Orleans, was cap-

tured in battle and lost his head at Toulouse in 1632. He died childless. Chantilly thus fell to his widow, and then, at her decease, to Charlotte Marguérite de Montmorency, Princesse de Condé and mother of the great Condé. Here begins a new chapter in the history of Chantilly.

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The Grand Condé, whose name always evokes that of Chantilly,

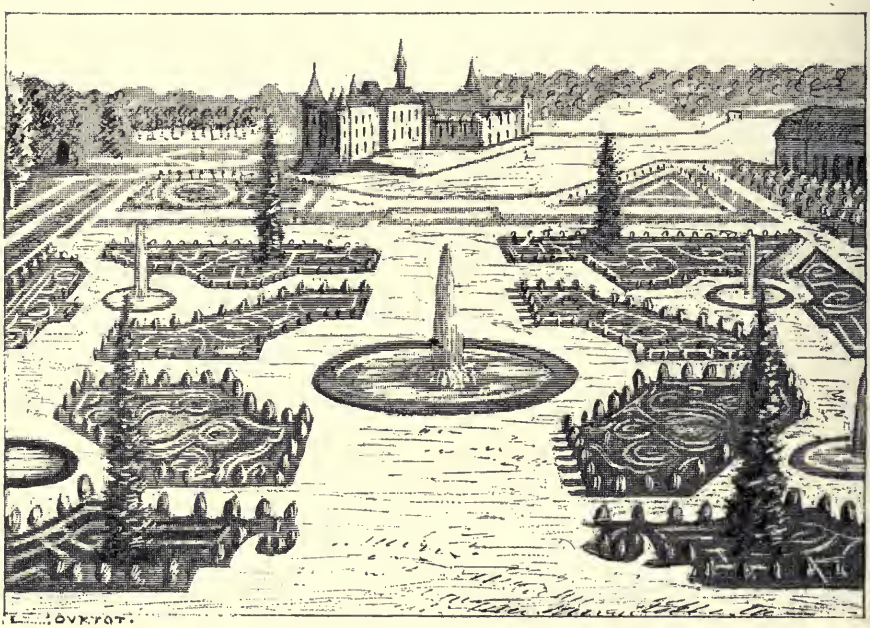


FIG. 7. CHANTILLY CASTLE UNDER THE GRAND CONDÉ.
Le Parterre de l'Orangerie. Architect Le Nôtre.

had an early and a brilliant start in life. It may be said of him, as of Corneille's *Cid*:

> Ses pareils à deux fois ne se font point connaître,
> Et pour leurs coups d'essai veulent des coups de maître.

He was but twenty-two years old in 1643, when he defeated the Spaniards at the famous battle of Rocroi. After that, he won victory after victory. But his imperious temper, violence and ambition caused him to be imprisoned at Vincennes, in 1650, during the troubles of the Fronde, by order of the prime minister, Mazarin. Soured and enraged by this treatment, he escaped, some time later, and (in 1653) did not hesitate to enter the service of the Spaniards. He laid waste the provinces of the North. Five years after he be-

came reconciled with Mazarin, but was kept in the background. He was then living at Chantilly, and not being able to endure inaction, undertook large building operations there.

He began with the park, employing as architect-gardener a man whose name was destined to become celebrated in the art of laying-out gardens, Le Nôtre. Under this man's directions, immense works were commenced, on a plan which took twenty years to execute, comprising quite a system of canals and fountains. Never

FIG. 8. CHANTILLY CASTLE UNDER THE GRAND CONDÉ.
Le Parterre de l'Orangerie. Architect Le Nôtre.

has more been done to provide an abundance of water in a park. As is shown by the general view of Chantilly, the Castle is surrounded by water on all sides; but besides, in the park there are large canals, cascades, a machine for raising water to a high reservoir, and playing fountains which "ne se taisent ni jour ni nuit." The canals were big enough to admit a good-sized sailing boat, which used to go along them followed by another containing a band of musicians. Le Nôtre created Chantilly before Versailles. The king came there in 1671, and was so delighted with Le Nôtre's work that he engaged him for the work at Versailles, which was just being commenced.

A considerable portion of the Chantilly of Le Nôtre's time has disappeared. We have, however, some old views of it, one of which we reproduce (Fig. 7). It shows the French flower-bed, which stretched from the Castle to the small town of Chantilly. This has been replaced by an English park; but the big canal, the lateral

ones, the *sylvie* park and the *Cabotière* park still remain. It is from this period also that dates the terrace in front of the entrance, where Corneille's statue stands. One descends from this terrace to the park by flights of steps. Rockwork grottos ornament its two sides. The subjects designed by Le Nôtre were executed by the sculptor Jean Hardy (Fig. 9).

The great Condé drew to Chantilly the most renowned writers of the day, and provided work in the Castle and park for the best artists. He had Boileau, Racine, Molière (whose pieces were played in the Castle), La Fontaine, La Bruyère who lived there a long

FIG. 9. SCULPTURES AND FOUNTAINS ON THE WALLS OF THE GRAND STAIRCASE. Chantilly Castle. Designed by Jean Hardy under the direction of Le Nôtre.

time, Bourdaloue, Malebranche, Fénélon. However, his violent, imperious temper did not always make life pleasant to the men of letters whom he gathered together, and the following charming *mot* was once addressed to him by Boileau after an altercation: "Je ne discuteria plus avec Monsieur le Prince quand il aura tort."

Condé again took up military service in 1668. He seized the Franche-Comté for the king and distinguished himself by fresh victories.

He afterwards returned to Chantilly, and it was then (1671) that

he received the visit of Louis XIV., who came, accompanied by his court, for the purpose of seeing the works of which there had been so much talk. The king only spent two days there, and these two days cost Condé more than 180,000 francs. Mme. de Sévigné has left us a celebrated account of this reception, and it is worth quoting, as it gives us some valuable details concerning court life and that of the great nobles of the time. It also describes in a vivid way the death of Vatel, who was ex-butler of the Superintendent of Finance, Fouquet, and who had passed into Condé's service. Here is what the vivacious correspondent wrote on the 26th April, 1671:

"The king arrived Thursday evening. The hunt, the lanterns, the moonlight, the promenade, the collation in a spot carpeted with jonquils, all went off splendidly. We supped. There were a few tables from which the roast was absent, owing to several unexpected diners. This upset Vatel, who repeated several times: "I am disgraced; this is an affront which I will not support." He said to Gourville: "My head swims; help me to give orders" The prince went to his room and said to him: "Vatel, all is going well; the king's supper was the finest thing possible."

FIG. 10.—THE GREAT CONDÉ.

We know from Gourville's memoirs that there were four principal tables, viz., 1.—That of the king and his brother; 2, That of the Prince de Condé; 3, The Duc d'Enghien; 4, The Duc de Longueville; and no less than fifty-six other tables, for which tents had to be erected on the lawn. Mme. de Sévigné continues:

"At four o'clock in the morning, Vatel made a round and found everybody asleep. He encountered a small purveyor who was bringing in two loads of sea fish, and asked him: "Is that all?" The man answered: "Yes, Sir," not knowing that Vatel had sent for fish to all the seaports. He waited some time, but the other purveyors not appearing, he became excited, fearing he would get no more fish. He went to Gourville and said: "Sir, I shall not survive this disgrace; my honor and reputation are lost." Gourville laughed at him. Then Vatel went to his room, put a sword against the door and transpierced himself. But he did not fall dead until

the third thrust, for he gave himself two that were not mortal. In the meantime salt water fish was arriving from all sides. Vatel was sought for, to distribute it. No answer being given to the knocks at his door, the room was broken open and he was found lying in his blood. The prince, who was at once informed, heard the news with much sorrow, and the duke shed tears. . . ."

The changes effected by Condé in the architecture of the Castle were less happy than his embellishments in the park; yet they were entrusted to the greatest architect of the time, Mansart, who afterwards built the Château of Versailles. The man, however, counts for little when the method is bad. We give two views of Chantilly;

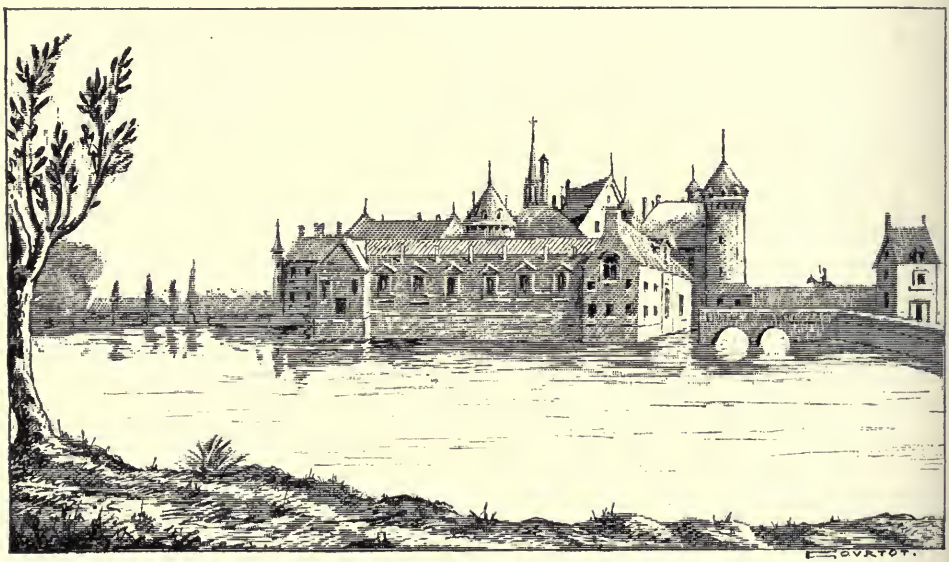


FIG. 11. CHANTILLY CASTLE IN THE 17TH CENTURY BEFORE MANSART.
Print by Israel Silvestre

one as it was under Condé but before Mansart's restorations, and the other as it was after Mansart, in the eighteenth century. The comparison is instructive.

In the engraving by Israel Silvestre (Fig. 11) one sees the picturesque outline that Chantilly retained from the Renaissance up to the second third of the seventeenth century. There are still towers and pointed belfries and high roofs, while the fronts are unsymmetrical. Mansart had not yet begun his task.

The newspaper "Le Mercure Galant" of September, 1688, tells us distinctly what was the scheme of this great architect, who displayed all the seventeenth century fondness for cold, solemn uniformity. "M. le Prince is having work done at present to make the

inside of the courtyard regular and give the outside quite a new face, either by the piercing of three rows of windows or by the roofs, which will be all of equal height à la Mansarde." "Regular!" The great word was let out. As can be seen by a glance at an engraving of 1738 by Dubourg (Fig. 12), Mansart's castle was perfectly regular; façades, windows, dormers and roofs, everything was brought into line. It was very ugly, however, and we have no cause to regret the disappearance of the "regular" but unpleasing château erected by Mansart.

Mansart had begun with the interior of the small castle. He

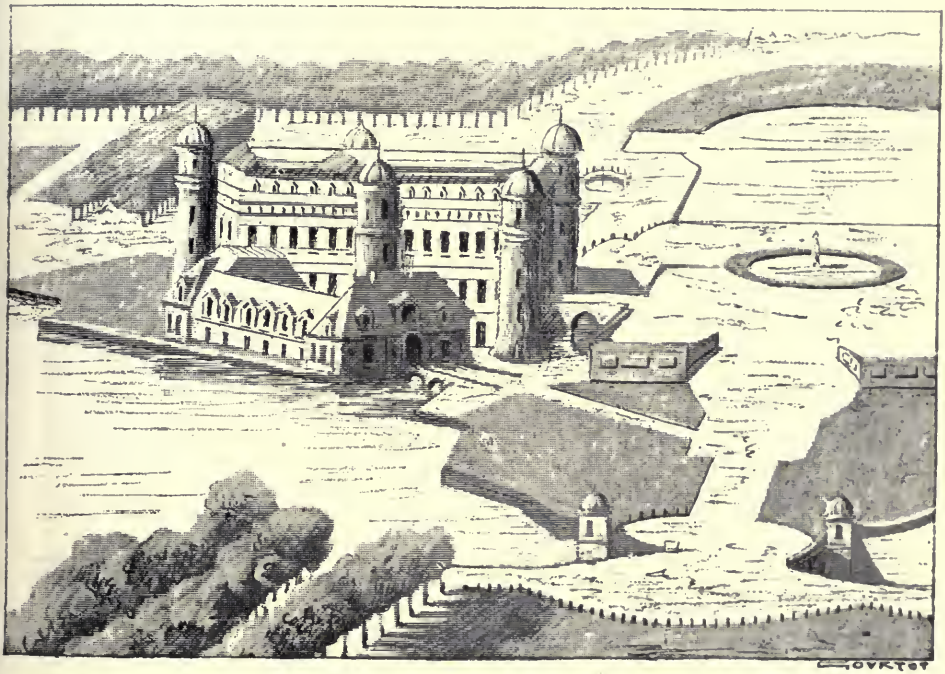


FIG. 12. CHANTILLY CASTLE IN THE 18TH CENTURY, AFTER MANSART.
Print by Dubourg.

arranged the rooms in the form they have retained up to now. They served as the personal quarters of the great Condé.

Condé died in 1686. In his hands Chantilly had acquired a European reputation. Princes, ambassadors, warriors and men of letters throughout the continent were eager to visit the beautiful home of the hero of Rocroi.

It was in the great Condé's time that the little town of Chantilly came into existence. It now has five thousand inhabitants, and is the chief horsebreeding center in France. The increasing number of visitors obliged Condé to allow the erection of a few houses near

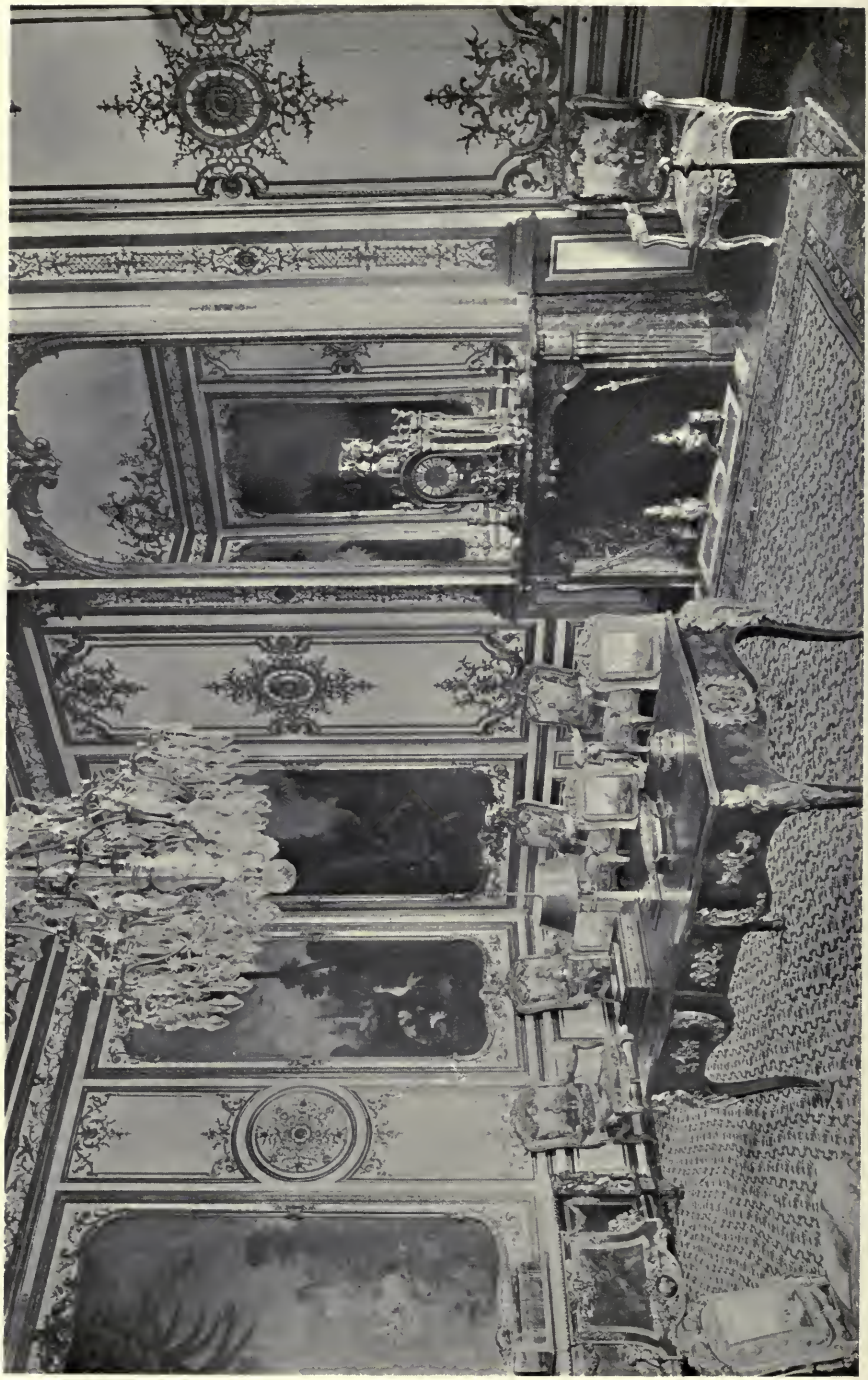


FIG. 13. ROOM OF THE PRINCE DE CONDE. Woodwork of 1720; Louis XV. Furniture. Chantilly Castle.

the Castle to serve as inns, and thus originated the modern town of Chantilly.

The affection for Chantilly was, moreover, hereditary with the Condés. The great Condé's son, Duc Henri Jules, also resided there. He, like his father, desired to embellish the park and the castle. He constantly walked about, followed by secretaries to whom he dictated the ideas that occurred to him for the beautifying of his domain. He expended immense sums of money upon it. He employed Coysevox and Coustou, and sent to Rome for copies of busts and statues of emperors, which are still to be seen, particularly in front of the small Castle. He gave sumptuous entertainments. He completed the *Galerie des Batailles*, in which all Condé's victories were depicted.

His son, the Duc de Bourbon, prime minister of Louis XV., continued the works. It was then that was executed that admirable gilded woodwork in the rooms of the Châtelet, being some of the finest models of Regency style, and the decoration of the *Salon des Singes*, which has been attributed to Watteau, but was in reality executed by Christophe Huet, in 1735.

This apartment has been preserved intact. It is a most perfect example of the decorative art of the eighteenth century. We reproduce a view of the Prince's bedroom (Fig. 13). All the woodwork was executed between 1718 and 1722. The ground is white, the relief gilt. The articles of furniture are not those which were originally at Chantilly; they come from the Condé's, however, and were put there by the late Duc d'Aumale. The seats, in Beauvais tapestry, represent rural subjects after cartoons by Leprince. They are in an excellent state of preservation. One hesitates to estimate the value of this large quantity of furniture when one thinks that six armchairs and a lounge in old Beauvais tapestry bring several hundred thousand francs at public sale. A chest of drawers inlaid by Riesener, with bronzework by Henrieu, would be a fitting pendant to the bureau of Louis XV. contained in the Louvre and which is by the same artists. The bureau standing in the middle of the room is Louis XV.; the decorative paintings are the work of Christophe Huet. We also publish a fragment of wood carving from the adjoining room in order that our readers may form a notion of the admirable style of this celebrated joinery work, and of the breadth and freedom of the relief work. Many copies of old styles have been made, but how cold, commonplace and lifeless our imitations appear when we have the originals before us in all their beauty. The *Salon des Singes* has the finest and brightest decoration. As Fig. 14 shows, the panels are painted. Huet's work is exquisitely graceful and well deserves the worldwide renown it enjoys.

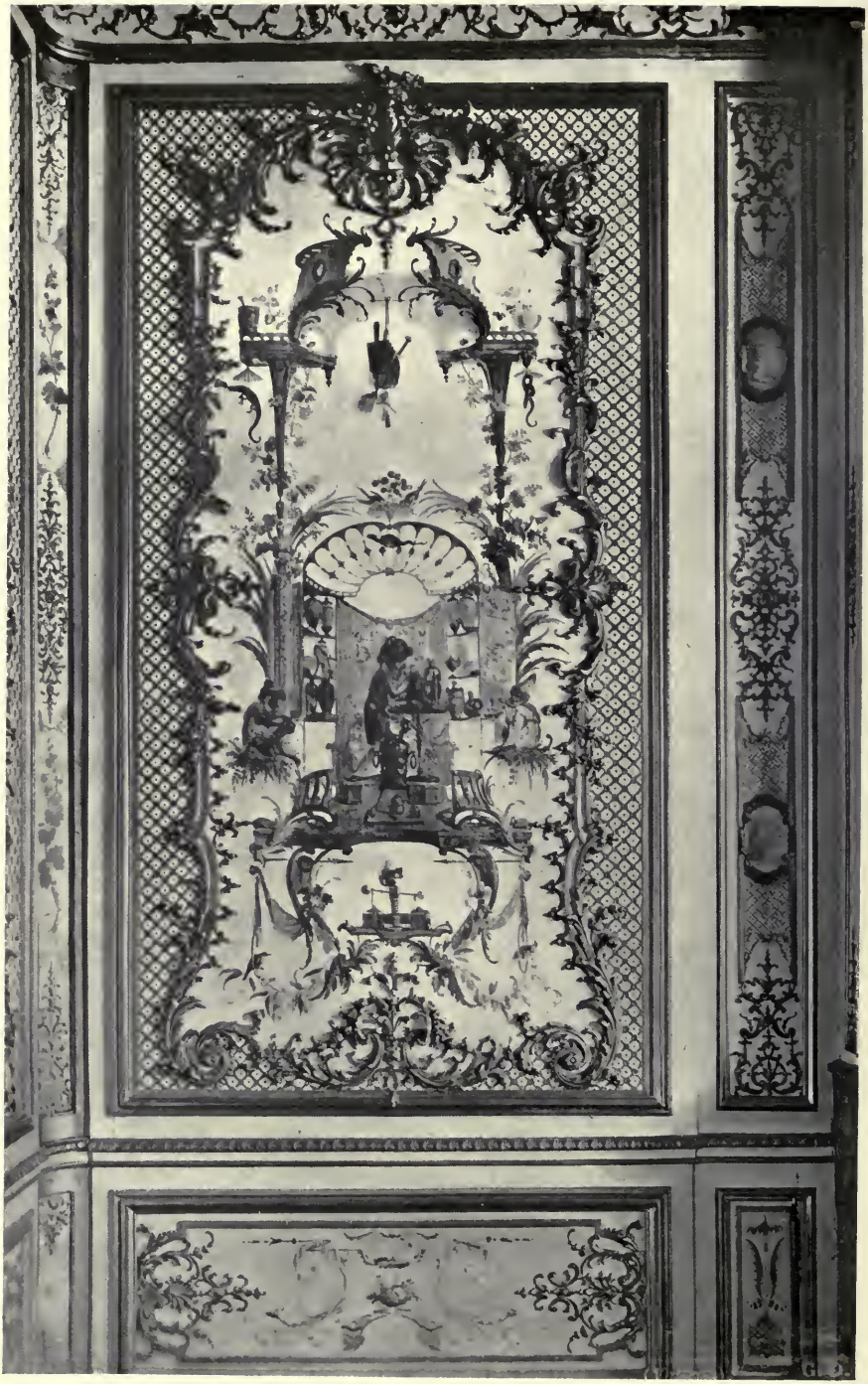


FIG. 14. PANEL IN THE "SALON DES SINGES."
Chantilly Castle. Christophe Huet, Painter.

This Louis Henri de Bourbon, grandson of the famous Condé, possessed a large fortune, which he tripled in operations of the bank founded by Law, author of the notorious scheme called the South Sea Bubble. When he ceased to be minister he went to live at Chantilly with his mistress, the Marquise de Prie, and held there what was really a royal court. Chantilly was at that time the scene of a romantic episode which ended sadly. The duke's sister, Mademoiselle de Bourbon, a very beautiful girl, loved a gentleman of the court of Louis XV., M. de Melun, and for his sake refused to marry a royal highness. As her brother opposed her union with

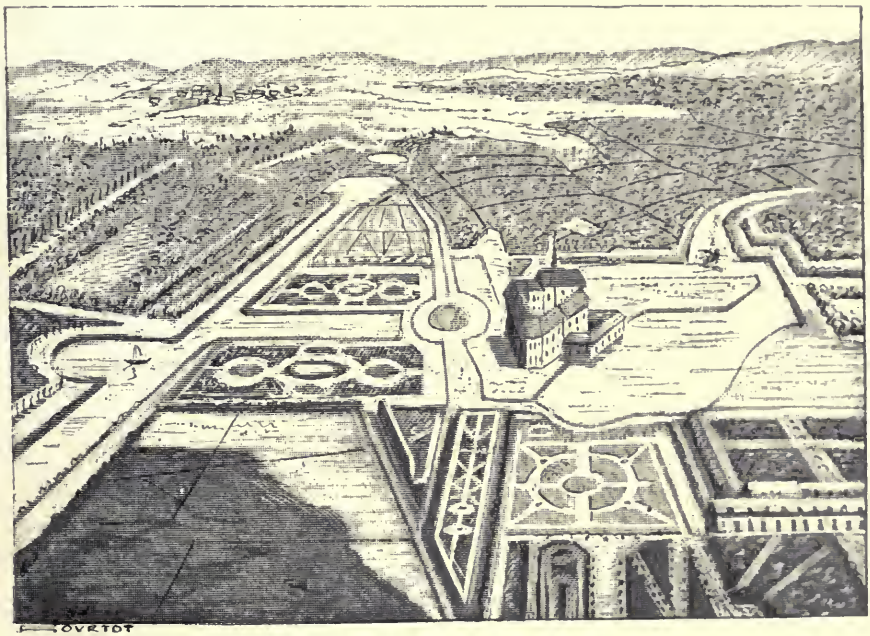


FIG. 15. GENERAL VIEW OF CHANTILLY IN THE 18TH CENTURY.
From an engraving by Perelle.

M. de Melun, the lovers decided upon a secret marriage. One night M. de Melun and Mademoiselle de Bourbon crossed the grand canal in a boat and went to a priest, who married them. But it was a shortlived union, for the next day, during a hunt, M. de Melun was injured by a stag and died within a few hours. A funeral service took place in the Castle Chapel. Mademoiselle de Bourbon was present at his death and at his funeral, with a broken heart, but afraid to avow that she was the wife of the dead man.

The same Duc de Bourbon built the Chantilly stables, one of the best examples of eighteenth century architecture and Aubert's masterpiece. Their erection occupied from 1720 to 1735, and the dec-

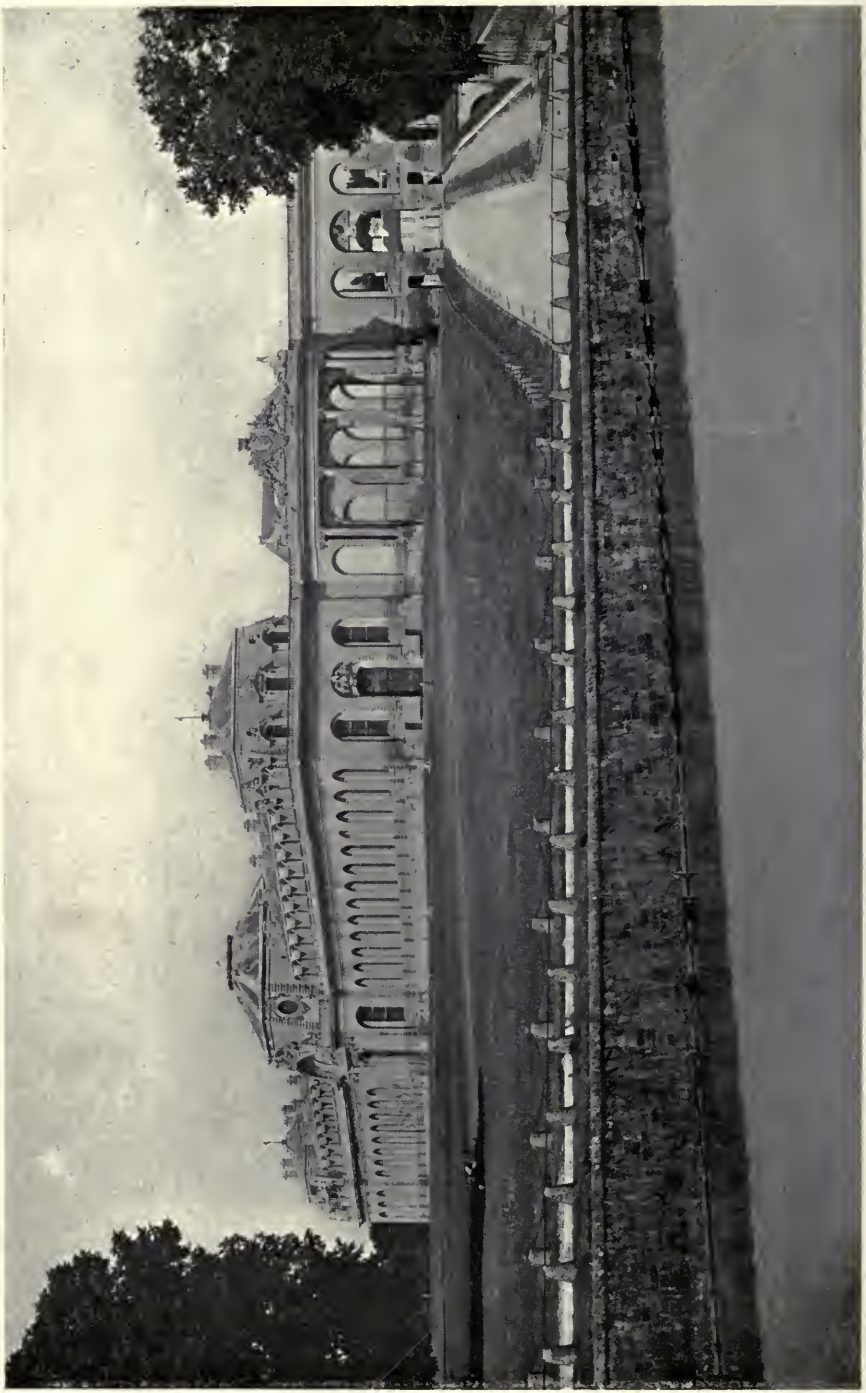


FIG. 16. THE STABLES AT CHANTILLY.
One of the best buildings of the 18th Century.
Designed by Aubert.

oration, by Bridault, was only completed in 1736. The principal block has a length of 610 feet, with a height of 45 feet up to the entablature. It is terminated by two square pavilions and is cut in the middle by a large pavilion with a hip-roof. The doors of the square pavilions are surmounted by end-ornaments, upholding three horses, viewed in face and the heads and legs of which are salient. Our Fig. 16 shows the principal front of the stables properly called, which border on the present Chantilly racecourse. It is a building of one story with garrets, and is of fine style, noble and harmonious. Its remarkable stone dressing produces a strong impression. It is one of the most successful works of the time, and I am inclined to compare it favorably with the pleasing creations by Gabriel, to be seen on the Place de la Concorde in Paris.

When the emperor Paul I. of Russia visited France incognito under the name of Comte du Nord, in 1782, he went to Chantilly, and grand festivities and magnificent hunting parties were organized in his honor. It is said, but the story is probably an invention, that one evening the Duc de Bourbon led the Comte du Nord to dine, together with his suite, in a splendid apartment all hung with Gobelins tapestries, between which shone tall bronze candelabra. And the Duc asked the Tsar: "Sire, where do you think you are?" The Tsar replied: "In the largest room of the Castle, which I had not seen before." Then the duke made a sign; the tapestries were drawn back all at once, and the diners saw a hundred horses in their stalls with grooms at their heads. The table had been laid in the central pavilion of the stables!

The last Condé who lived at Chantilly was Louis Joseph de Bourbon, who was born in 1735 and died in 1818. Like his ancestors, he developed the park and added to its beauties. He also increased the collections contained in the Castle by purchasing various works of art. It is to him that we owe the "*Ile d'Amour*" and the small temple with the antique Venus-Callipyge, the present *Pavillon d'Enghien* and the tennis court. He also made the *Hameau* and the *Jardin Anglais*, which were begun in 1772 and which indicate the revolution in taste which was then taking place in France. At the Trianon Marie Antoinette imagined the Bergerie, and with her white hands made butter and cheese. It seemed as if nature and her beauties had just been discovered for the first time. A dislike was taken to the regular, methodical, artificial laying-out of lawns in the French style. There was, however, a good deal that was artificial in the new taste. People played at shepherds and pastoral life, but it was only a comedy. At Chantilly, when the Princesse Louise made her entrance there in 1775, shepherds and shepherdesses welcomed her at the Hameau with rustic songs and country dances. The life led by the occupants of the Caste was pleasant and

FIG. 17. MAIN ENTRANCE TO THE CASTLE OF CHANTILLY.

FIG. 18. THE GREAT STAIRCASE OF THE CASTLE OF CHANTILLY.

free from cares. Never had idle, luxuriant living attained such perfection. Select company, high-placed men and lovely women, a few artists and writers, a philosopher or two to make conversation, a magnificent château full of the finest works of art, big forests close by in which to hunt the stag, the deer and the boar, boating on the grand canal, followed by another boat full of musicians, picnics at the waterside, then, in the evening after supper, a comedy, succeeded by fireworks in the middle of the water. But it was the life of *Fêtes galantes* depicted for us by talented painters; it was a life wholly taken up by pleasure—a perpetual *Embarquement pour Cythère*; dresses of red violet silk, shady bowers, soft breezes, with the dash of sentimentality needed to give pleasure a rarer savor.

But such a life cannot last. We are clearly not intended to exist exclusively on cakes which we do not earn, while around us are millions of poor people who cannot get bread. The Revolution broke out like a thunderclap, and the delicate, selfish enjoyments of a favored few were at an end. The people now made their powerful voice heard. The Prince de Condé was the first to take alarm. As early as 1789 he gave the signal for emigration, and soon afterwards he was at Coblentz, at the head of that army of émigrés which, allied with the foreigner, came to fight France. Chantilly Castle paid for its master. In 1789 the national guards of Paris came there and carried off the cannons, and there was also a small amount of pillaging. Then, in 1792 and 1793, most of the furniture, pictures and works of art were removed to Paris by order of the government. What remained was sold at auction. Thus was scattered in three short years what it had taken four centuries of constant efforts and immense outlay to gather together. Nothing was left at Chantilly of all that had ornamented it. The Castle, after serving as a prison for the suspected persons of the county, was sold to speculators and totally demolished, with the exception, as we have seen, of the Petit Château, the stables, and the Château d'Enghien.

Under the Empire, Chantilly belonged to Queen Hortense. At the Restoration, the Prince de Condé again entered into possession of his property. He went to live in the Petit Château. It was he who made the present English garden (1820). He brought back a few things which the State was willing to restore to him, and these are still at Chantilly to-day.

The last Condé died in 1830, without children, leaving Chantilly and his fortune, which latter was considerable, to his nephew, the Duc d'Aumale.

But the time when Chantilly was to flourish once more had not yet come. After the Revolution of 1848, the Duc d'Aumale was banished and Chantilly confiscated. The English banking firm of

Burdett, Coutts & Co. bought the property for eleven million francs. The duke did not return to France until after the Franco-German War of 1870. He too was alone in the world, his wife and children being dead. Chantilly was restored to him by virtue of a decree rendered by the National Assembly. He decided to rebuild the Château and make it once more a rich sanctuary for Art—not for a selfish purpose, but in order to bequeath it to the nation. He called to him a young architect who was already well known, M. Daumet, and in 1876 a start was made. The work was finished in

FIG. 19. THE CASTLE OF CHANTILLY, AS SEEN FROM THE ESPLANADE.

1882. It is this modern, this princely edifice that we have now to examine.

* * * * * *

The Duc d'Aumale wanted to build a château that should recall, not the cold regularity of Mansart's production, but on the contrary, the elegance and picturesqueness of the Renaissance building, a building much more suitable for the site. The task was a difficult one, as the lines of the old foundations, which it had been resolved to retain, made it necessary to follow an awkward configuration, as will be understood from the plan which we reproduce. M. Daumet solved the plan in an admirable manner. The Chan-

FIG. 20. GALLERY OF THE STAGS.
Formerly the Dining-Room.
Chantilly Castle.

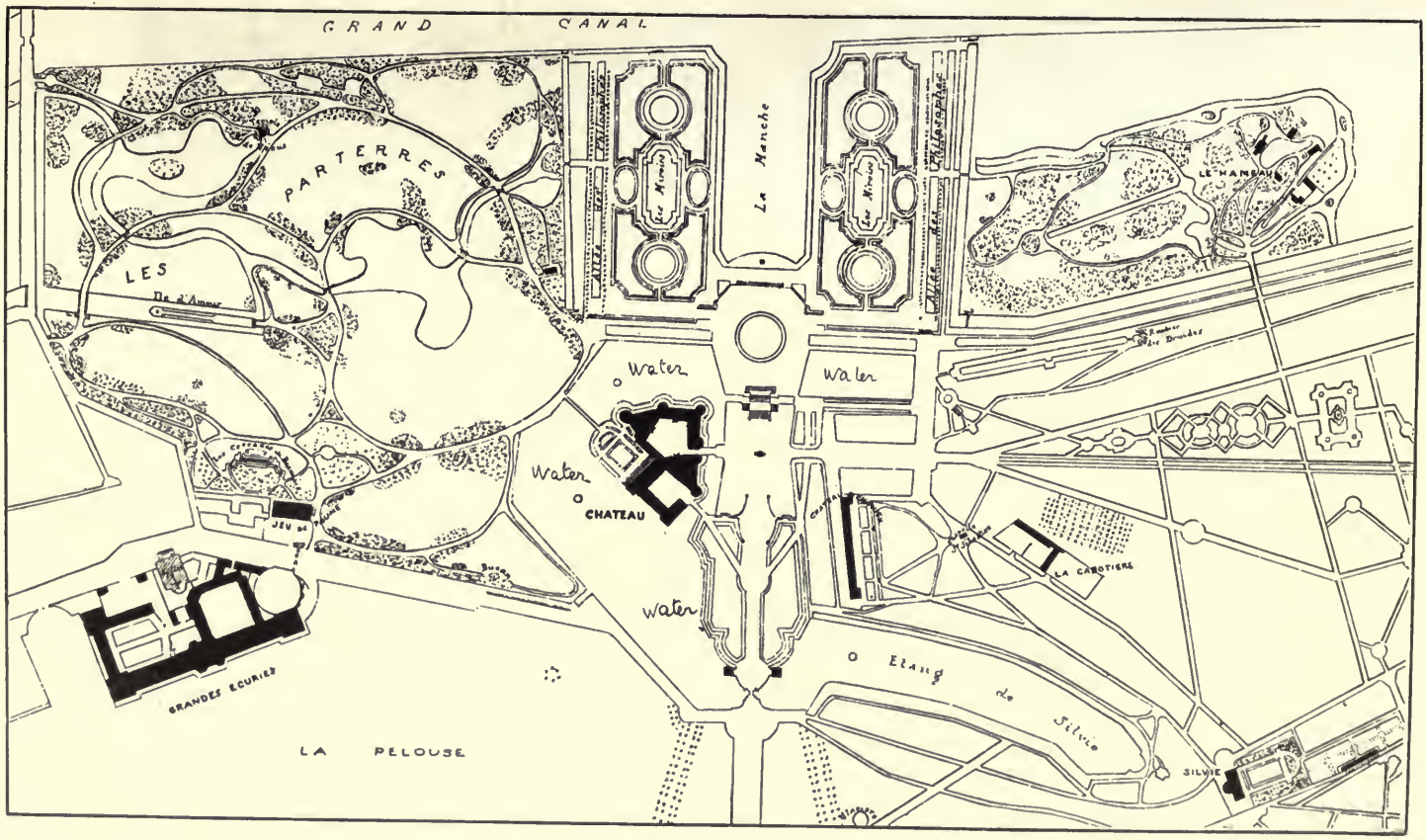


FIG. 21. PLAN OF CHANTILLY CASTLE AND ITS ENVIRONS.

FIG. 22. ALTAR IN THE CHAPEL OF CHANTILLY. Jean Goujon, Sculptor. Jean Bullant, Architect.

tilly of to-day, like the old Castle, is entirely surrounded by water. It is entered over a stone bridge (Fig. 24). The general aspect is extremely picturesque and alluring, without narrowness of execution, but, on the contrary, with a fine fulness in the frontages giving on the park, cut at each corner by a tower. From a distance, the general view of Chantilly, reflected in the water, with its turrets, its weather vane (on the chapel), its monumental chimneys, and the steep slope of its roofs, is exceedingly fine. This royal castle rising from amid the waters produces a unique effect.

The Castle is reached by an easy gradient ending on an esplanade upon which stands a statue of the High Constable, Anne, sculptured by Paul Dubois, facing the home of his ancestors, rebuilt and restored to its former splendor. The esplanade, which is surrounded by walls at the angles of which are statues, some modern, some seventeenth century, leads to the main entrance to the Castle, the courtyard of which is closed by a gallery of very ingenious composition, connecting the chapel with the right hand block by a series of arcades of handsome design. At the gate itself, above the bridge spanning the moat, stand marble replicas of Michael Angelo's two *Captives*, which the High Constable Anne brought back with him from Italy during the wars of François Premier and placed in the Château d'Ecouen. The originals are now one of the treasures of the Louvre Gallery. Having traversed the bridge and the gateway, one enters the grand courtyard, of which Fig. 28 gives an inside view. The chapel forms one corner thereof. This chapel is a charming and original creation, quite after the sixteenth century taste, at which time there still remained some invention and variety about architecture. One also admires the covered gallery, a thoroughly Renaissance composition. I do not care so much for the lions above the gateway, at the four corners of the bell-turret. They appear to be afraid of falling and to hold on convulsively by their claws.

In the large vestibule, which is reached by a covered carriageway, there is the grand staircase leading to the lower floor which used to be the quarters of the Prince in the old Castle and which this vestibule connects with the new one. Fig. 18 shows the arrangement of this vestibule and of the grand staircase, the balustrade of which (modern) is a masterpiece of forged iron, as is shown by the detail. This balustrade was designed by Daumet and made by Moreau Frères. Opposite the grand staircase, a few steps take one to what used to be the dining-room of the Duc d'Aumale, but is now called the *Galerie des Cerfs* (Fig. 20). On the walls of this spacious apartment hang splendid Gobelins tapestries of the seventeenth century bearing copies of the well-known scenes called: *Des Chasses de Maximilien*, which date from the sixteenth

century. Thence one passes into a very large Picture Gallery filled with masterpieces of all the schools. The two wings to the right and left of the Picture Gallery are occupied by museum rooms in which are displayed valuable canvasses and works of art collected by the Duc d'Aumale for Chantilly as far back as 1850. Among other admirable works there, one sees *La Vierge dite d'Orléans*, by Raphael, and the celebrated 40 miniatures belonging to Estienne Chevalier's Primer, painted in the middle of the fifteenth century by Jean Fouquet.

The Library has been built on the site of the old moat which separated the big Castle from the Châtelet. It contains some very fine bindings of the sixteenth century, besides rare books of all sorts.

Then come the former apartments of the great Condé in the small Castle, of which we have given some detail views and a view of the *Galerie des Batailles*. On the ground floor, underneath this apartment, are the rooms which were used by the Duc d'Aumale. Next there is the Chapel, in which several old works of art have been reinstated—admirable pieces of inlaid wainscoting dating from the sixteenth century, and stained-glass windows of the same period. There is also an altar of Senlis stone, the joint work of Jean Bullant and Jean Goujon (Fig. 22).

Such is the Château de Chantilly of our day. It is now beyond the reach of those vicissitudes to which private property is liable. The Duc d'Aumale has left it by will to the Institute of France with express directions that it be always kept freely open to artists, savants and scholars. The present estate comprises more than 14,000 acres, the greater portion being forest land which is let out for hunting and shooting. The property produces a yearly revenue of about eighty thousand dollars. The money is applied to the upkeep of the Castle, park and collections, which may be increased by donations and purchases. Henceforth, Chantilly will be one of the French shrines for all lovers of art.

Jean Schopfer.

POLO PONY STABLE.
"Harbor Hill," the Estate of Mr. Clarence Mackay, Roslyn, L. I.
Photo by Thomas E. Marr.
Warren & Wetmore, Architects. Guy Lowell, Landscape Architect.

THE LAY-OUT OF A LARGE ESTATE.

"Harbor Hill," the Country-Seat of Mr. Clarence Mackay, at Roslyn, L. I.

THE increasing tendency on the part of Americans to live more in the country, and to take more interest in their country places is having an important effect upon American architectural practice. Landscape architecture is becoming a well-recognized department of architectural design—recognized, that is, not merely by the profession, but by the clients of the profession. Time was when the good American, even if he admitted the assistance of a trained designer in working out the plans of his house, never doubted his own ability to select its location together with that of the outlying buildings, and to plan the approach and the other lines of communication. As to the arrangement of the flower beds that was a business, for which the only necessary qualification was the wearing of a petticoat. A good deal of this general disposition still remains. The ordinary American when he is building himself a country place, is much more likely to defer to expert counsel in the design for his house than he is in the lay-out of his grounds; and this is true in spite of the fact that the problem presented by the lay-out of an estate of as much as a few acres is frequently as difficult and as technical as the problem offered by the design of the house.

In fact, one might go further and declare that the average man of intelligence is much more likely to understand the means, whereby a successful architectural result is obtained than he is to understand

the means, whereby a successful result is obtained in landscape architecture. Well-designed buildings are more familiar to him than well-designed estates, and he generally fails utterly to appreciate that the values to be sought in deciding on the situation of a house, a flower-garden, and the convenient accessories of a country place are as abstract as the strictly architectural values and perhaps even more recondite. The situation of the house in relation to the view, the exposure, the prevailing winds, the surrounding foliage, and the other buildings; the situation of the garden in relation to the house, the exposure, the view and the trees; the scale and dimensions of the house in relation to the large planting; the extent to which the straight lines of an enclosure or of some subordinate architectural feature are desirable either to define the view, or partially to shut it out; the careful distribution of open and planted spaces in the immediate vicinity of the house; the use of proper planting, sometimes to soften the architecture, sometimes to complete and enhance certain native landscape effects, or sometimes to add a spectacular and dramatic quality to certain particular points of view; the lay-out of the approaches for the purposes both of convenient access and of the best effect; and the running of the roads in relation to the grades of the land and the making of entertaining vistas—the complete satisfaction of all these requirements or of half of them, is not a business which an amateur, even in a petticoat, is qualified to supply; and requirements of this kind, although less complicated and numerous, exist in the cases of comparatively small estates as well as in those of larger size.

The problems of landscape design are, in truth, so special that some landscape architects claim for it a wholly special province. The claim is that the landscape architect should be carefully distinguished from the house architect, and that, when it comes to designing a large estate, the two kinds of architect should in some way work together. Whether in such instances of coöperation the landscape architect should commission the house architect, just as the latter might commission an engineer to design a heating plant, or whether the house architect should commission the landscape architect, or whether both should be independently commissioned by the owner of the estate—these several alternatives, which might cause some difficulty in practice, have been left open both by people who make this claim and the owners who have sought to make the claim good. As a matter of fact all three methods have been used, and doubtless will continue to be used; but I do not believe that the landscape architects will become a branch of the profession rigidly distinguished from house architects. At the present time many excellent architects are undoubtedly ill-qualified to lay out an elab-

THE LODGE AND GATE AT "HARBOR HILL."
The Estate of Mr. Clarence Mackay, at Roslyn, L. I.
Photos by Thomas E. Marr.
McKim, Mead & White, Architects. Guy Lowell, Landscape Architect.

THE MAIN AVENUE OF "HARBOR HILL."
The Estate of Mr. Clarence Mackay, at Roslyn, L. I.

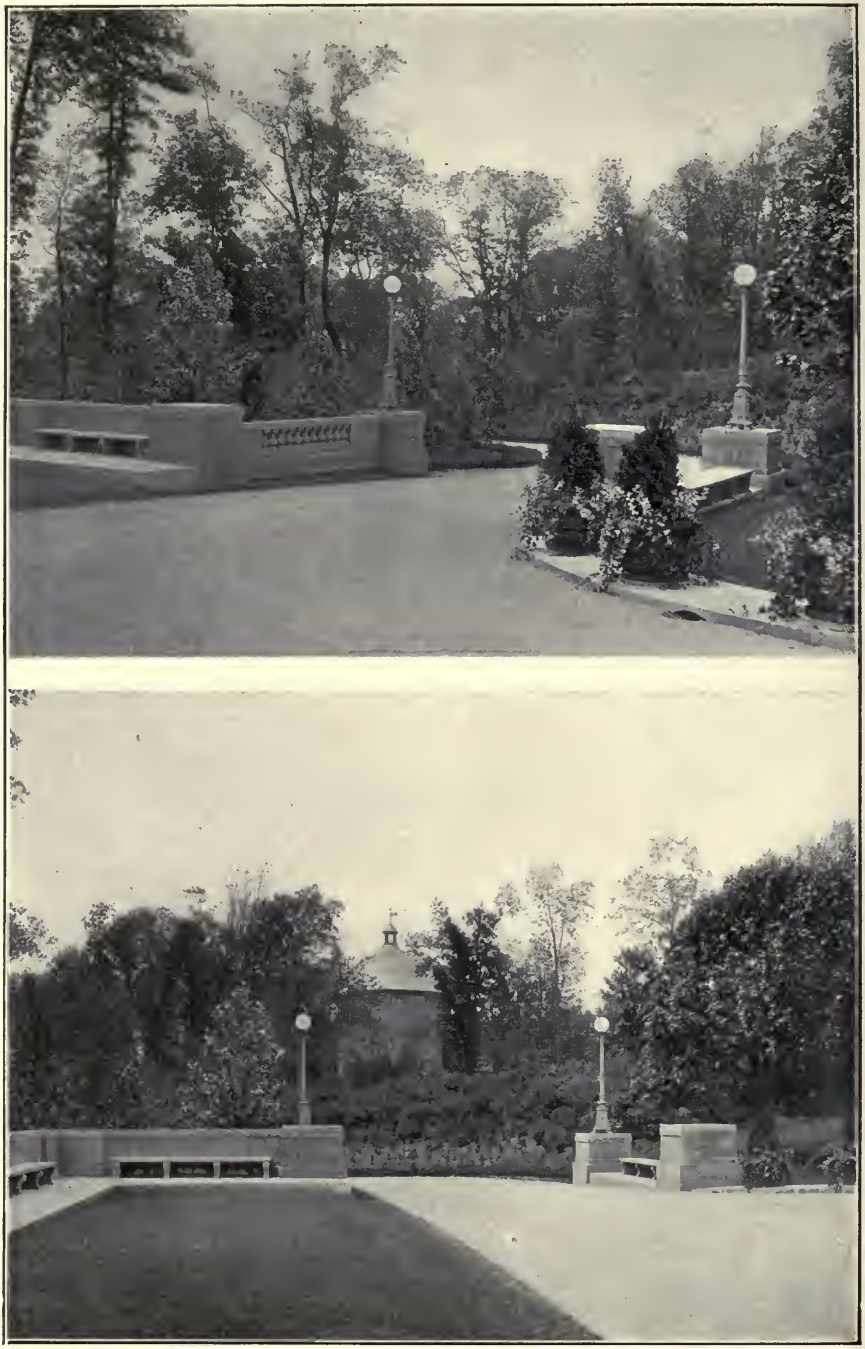
Photo by Thomas E. Marr.

Guy Lowell, Landscape Architect.

orate or even a small country estate. They know little about landscape in relation to architectural values; and in journeying through suburban regions inhabited by well-to-do people, one frequently sees the design of a tolerable house defeated by a wholly intolerable surrounding of landscape architecture. There is probably no form, for example, which American architects have borrowed from Europe, which has been more frightfully misused than the pergola. For this reason it would be well for candid architects, who distrust their training, gifts or experience as landscape designers, to call to their aid men, specially qualified to do this kind of work. But it is improbable that the two branches of the profession will be rigidly divided. Certain architects will be celebrated particularly for their work in landscape architecture; but the landscape architect will, whenever he gets a chance, design the buildings as well as the lay-out, while the house architect will consider himself, and I hope will be, as fully competent to lay out an estate as he is to decorate a handsome room.

The number of large country estates, in which a serious attempt has been made to obtain a complete architectural and landscape design is comparatively small. The American farmer, whether he churned a few hundred acres on a New England hillside or a few thousand acres of western prairie, has rarely had the money, the taste or the leisure to do anything with his land but work it. On the other hand, rich men of business, in buying a country place, have until recent years been generally satisfied with a palace on a lot. Even when they owned comparatively large estates they had little impulse really to develop them; and this was only natural, because there is little use in spending lavishly for the purpose of making a country estate handsome, unless its owner has the patience to wait for results, and the leisure to enjoy them. Well! the owners of such estates take more leisure now than they once did. They spend more time in the country and more money upon it. They are becoming, if you please, country gentlemen, though in a different sense from an English country gentleman. They do not derive their substance from the soil, and their estates are laid out solely for their own pleasure. The farm is accessory to the house. The estate has no function, except the important one from a certain point of view, of contributing to the pleasure of the owner.

When country places assume the character indicated above, it is in some respects a limitation and in others an advantage. There can be no doubt that the peculiar charm of the English country-houses has issued from the permanent and substantial ties which have connected their owners with the soil. These gentlemen lived not only in the country, but on it. For generations they



THE BELL-MOUTH AT "HARBOR HILL."
The Estate of Mr. Clarence Mackay, at Roslyn, L. I.
Photos by Thomas E. Marr. Guy Lowell, Landscape Architect.

have given lavishly of their time and money, so that their houses and the surroundings might look or serve its purpose better; and this prolonged and devoted attention to the good of their estates has redeemed many initial architectural mistakes, and has absolutely confirmed the value of many happy architectural ideas. But the English country places are unique in the continuity of the social and economic conditions out of which they were born. In the other countries of Europe forms of landscape architecture have been wrought, which in the essentials of appropriate design are superior to the English country places; and they have been wrought under economic conditions analogous to those which now prevail in this country. The Italian villas and gardens and the later French chateaux were erected for gentlemen who were merely sojourners on the soil; they were designed together with their surroundings for the purpose in one way or another of amusing owners, who derived large incomes generally from official employment; and these large incomes enabled their possessor to have their estates laid out in the light of a consistent and comprehensive architectural idea. In our own country the owners of very large estates are similarly free to conduct their operations in a generous way. By the lavish expenditure of money in energetically realizing a comprehensive plan, the architect can keep his client interested by means of quick and spectacular results.

The majority of the very large American country estates are situated in the vicinity of New York. Their owners are for the most part tied to the vicinity of Wall and Broad Streets by golden strings. They want the quiet of spacious country estate, and rapid transit to New York. Some of the estates are situated along the Hudson and some in New Jersey; but on Long Island more than anywhere else; and among the Long Island estates, one of the most interesting is "Harbor Hill," the estate of Mr. Clarence Mackay, at Roslyn. It is one of the most interesting because of its size, the opportunities which it offered, and the extent to which these opportunities have been used. The estate is by way of being completely developed to serve its purpose as a gentleman's residence; and it is extraordinary how much has been accomplished in a few years to touch up the landscape and soften the architecture with supplementary planting. The effect will, of course, be still greater after this planting obtains a good growth, and after certain additional improvements have been made; but the illustrations which accompany this text are as interesting for what they show as for what they promise.

In the case of "Harbor Hill" several different architects have coöperated to carry out the complete design. The house and the lodge are the work of Messrs. McKim, Mead & White: the stables,

THE STABLE AT "HARBOR HILL."

Photos by Thomas E. Marr.

Warren & Wetmore, Architects. Guy Lowell, Landscape Architect.

the barns, the dairy and the other accessory buildings have all of them issued from the office of Warren and Wetmore. Finally the designing of the approaches, the connecting roads, the planting and the garden was placed in the hands of Mr. Guy Lowell. Just at present we are interested exclusively in the work of Mr. Lowell. When he assumed charge of his share of it, the house was already under construction, and that element of the design was a condition rather than an opportunity; but the locations of all the other buildings were selected by him subject, of course, to the wishes of his clients, and the whole estate was laid out, cleared and planted under his supervision. While not responsible, consequently for the design of any of the buildings, or for the line of the road from the station to the house, he is responsible for their setting, for their approaches, for their arrangement, and for their connections.

The estate of "Harbor Hill" includes roughly about five hundred and thirty acres. It is a solid chunk of land about a mile square, bounded by the railroad, and the highway, with no public roads running through it, and with its dimensions approximately equal in every direction. Of the five hundred or more acres which it contains, only about seventy are cleared or cultivated land. The rest is timbered, and for the most part the timber is large and fine. The trees consist chiefly of hardwood, such as oak and chestnut. There are no evergreens, except a few cedars, and Mr. Lowell has cleverly used to the utmost advantage the small chance that he had to obtain winter foliage.

The name of the estate, "Harbor Hill," indicates that it does not consist, as so many estates on Long Island do, of perfectly level ground. On the contrary, it contains a large hill, which practically comprises the whole of the property. The top of the hill is pushed somewhat towards the southern line of the estate; but it is near enough the center thereof to justify the description of the property as a hill with approximately similar slopes in every direction. As a matter of fact the south slope towards the railroad station is steeper than the slopes in the other directions. On the other hand, the gentler northern slope terminates in fifty acres of comparatively flat land, a half a mile or more from the top of the hill.

In laying out such an estate as this for a gentleman's residence, certain arrangements are immediately suggested as given by the conformation of the land. The house would naturally be situated on the top of the hill, which, as it happens, affords an exceptionally good location for a handsome residence, and really magnificent outlooks both south and west. The hill is and always has been called "Harbor Hill," because it overlooks Hempstead Harbor, and because in former days its commanding position was used for a beacon to assist boats in entering the harbor. Since the whole of

the estate is tributary to the residence, the site of the residence became the central point of the lay-out, just as it was the dominating point in the conformation of the land. The roads radiate from this center, their lines being determined partly by convenience, partly by the grades of the hill, and partly by their appearance. Thus, as already mentioned, the south slope is steeper than any other. At the same time, since the railroad station is situated at the foot of the hill in that direction, the main approach to the house must climb the steeper slope. Even if it were desirable from the point of view of design to run the main road straight to the top of the hill, it would be impossible because of the heavy grade; and as a matter of fact, the drive curves gently up the hill until it reaches the top, at which point it turns into a straight approach.

If the conformation of the land established the top of the hill as the one inevitable site of the house, it is equally true that the level fields at the northern end of the property were marked as the proper place for the farm buildings and the service gardens. The only building on the top of the hill except the residence is the carriage house and stable. The other accessory buildings, the kennels and the chicken farm excepted, are scattered along the northern boundary of the property. They are not all of them grouped together, because, although such grouping is, perhaps, more convenient and economical, it results in a less interesting and varied lay-out. As it is, the superintendent's house, the farm buildings, the polo pony stables, the conservatory and gardens are most of them well separated; but they are connected with the house by a service road which takes a fairly straight course through the woods. The chicken farm is situated on the side of the hill near the eastern boundary of the property, and the kennels in the woods and closer to the house. Besides the road from the station to the farm buildings, to the chicken farm, and to the workshops, there is a handsome road to the north called the "North Drive," so as to connect the house with the water. The tradesmen are not allowed on the main approach, or upon the North Drive, and as the service road is inconvenient for them, the road to the chicken farm is partly for their benefit. In addition the estate is cut up with a number of attractive drives and bridle paths, across the woods, and running from one to another of the main roads. Indeed these woods are really laid out as a park, and, as we shall see, when we come to describe their planting, the effect of one kind of a park has been carried out in all the details of the design.

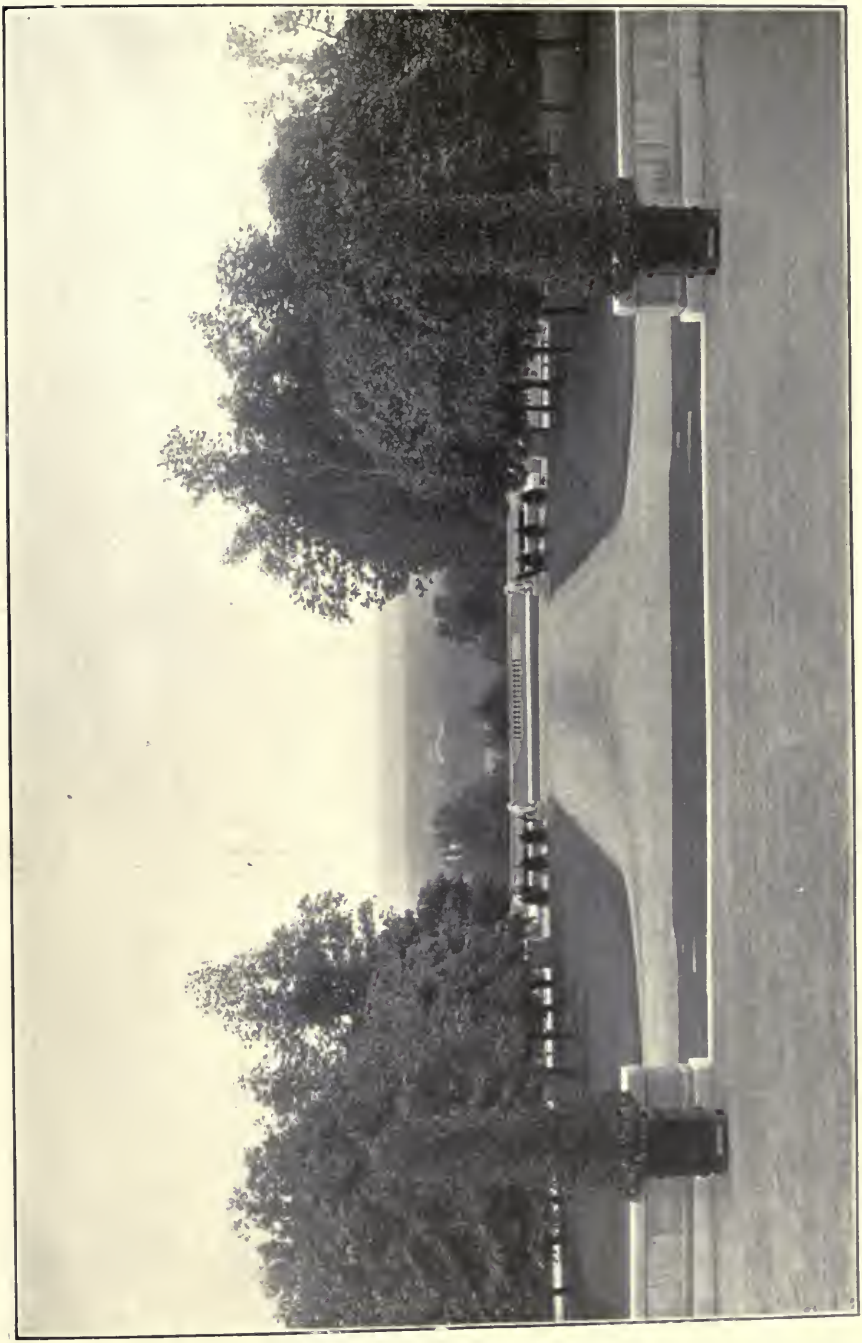
In the lay-out of a large estate it is generally the practice to keep the design of the grounds immediately around the house somewhat formal, so that a proper transition can be made between the definite lines of the architecture and the sinuous incoherence of nature;

APPROACH TO THE STABLE OF "HARBOR HILL." Guy Lowell, Landscape Architect.

Photo by Thomas E. Marr.

THE MAIN APPROACH TO "HARBOR HILL."

McKim, Mead & White, Architects. Photo by Thomas E. Marr. Guy Lowell, Landscape Architect.



LOOKING SOUTH FROM THE HOUSE AT "HARBOR HILL." Guy Lowell, Landscape Architect.

Photo by Thomas E. Marr.

THE WEST VISTA FROM THE TERRACE OF "HARBOR HILL." Guy Lowell, Landscape Architect.

Photo by Thomas E. Marr.

WEST FRONT OF THE HOUSE AT "HARBOR HILL."
Showing the unfinished formal garden.
Photo by Thomas E. Marr.

McKim, Mead & White, Architects.

Guy Lowell, Landscape Architect.

THE HOUSE OF "HARBOR HILL," FROM THE WOODS TO THE SOUTHWEST.

McKim, Mead & White, Architects. Photo by Thomas E. Marr. Guy Lowell, Landscape Architect.

THE TERRACE AT "HARBOR HILL."
Photo by Thomas E. Marr.

McKim, Mead & White, Architects. Guy Lowell, Landscape Architect.

BRIDGE IN THE WOODS ON "HARBOR HILL."

At this point the North Drive crosses the Service Road.

Photos by Thomas E. Marr. Guy Lowell, Landscape Architect.

and when this is done it is often difficult to run the more formal into the less formal parts of the scheme without passing rather abruptly from the one to the other. This aspect of Mr. Lowell's work was in the present instance made easier than usual, because the area immediately around the house but on the top of the hill, was naturally marked for formal treatment, while as soon as the land began to fall away, a less formal lay-out and scheme of planting was plainly suggested. It will be seen from the photographs that the immediate approach to the house consisted of a broad avenue running from the brow of the hill to the terrace and lined with

THE DAIRY OF "HARBOR HILL."
Photo by Thomas E. Marr.
Warren & Wetmore, Architects. Guy Lowell, Landscape Architect.

large maple trees which, it may be remarked, have been very recently planted. This avenue is a case absolutely of making over the land in order to suit the convenience of the residents of the house. In the beginning a deep gully intervened between what is now the bell-mouth and the terrace, and in order to obtain a straight formal approach the gully had to be filled in at an expense of many thousand dollars. The other straight and level road leading at right angles from the stable to the bell-mouth consists also of made land, which is one reason why the trees, which were of large size when transplanted, have proved to be such thrifty growers. The avenue

A WOOD ROAD AND THE SERVICE ROAD AT "HARBOR HILL."

Photos by Thomas E. Marr. Guy Lowell, Landscape Architect.

THE FARM BUILDING AND THE KENNELS AT "HARBOR HILL."

Photos by Thomas E. Marr.

Warren & Wetmore, Architects. Guy Lowell, Landscape Architect.

CONSERVATORY AND SERVICE GARDENS AT "HARBOR HILL."

Photo by Thomas E. Marr. Guy Lowell, Landscape Architect.

leading up to the house serves, of course, not only as an approach, but as a vista through which the very extensive and beautiful south view is seen. From the veranda on the west side of the house, the foliage has also been cut out, and a very lovely outlook has been gained thereby. In the distance are the Wheatleigh Hills, which are seen through a vista of trees and over what is at present a mall of green grass. The grass, however, or at least part of it, is only temporary. It is on this side that the formal garden is eventually to be situated, and a very remarkable opportunity the location affords for this kind of treatment. A formal garden on this site will be near enough to the house both for the easiest access, and to justify architectural features harmonizing with the lines and the scale of the house itself; it will, also, be bounded two sides by high trees, which inevitably check any excessive emphasis of the garden architecture, and give it a green background; and finally a very lovely landscape will be visible across the garden, but at a sufficient distance to prevent any clash between the modest beauties of the garden and the great expanse of the view. While the terrace and the bell-mouth have been defined by straight architectural lines, Mr. Lowell gets his formal effect in the immediate vicinity of the house chiefly by means of formal planting. In so doing he does not try to imitate the English evergreen hedges. The formal planting consists chiefly of the maple trees mentioned above, which were selected from a much larger number, because of the fullness of their foliage. These trees, which are about twenty-five feet high and wide, have been trimmed into symmetrical shape, and already give as mature an effect as if they had been planted for a generation.

The only other part of the estate, in which formal treatment has been used is in the immediate vicinity of the conservatory, where the vegetable and flower gardens are situated. This part of the design remains uncompleted; but what has already been done gives some idea of the possibilities which a combined vegetable and flower garden offer for attractive treatment. In general the flowers are planted in the borders of large beds, the centres of which contain rows of vegetables; and the consequent effect is determined by the fact that, just as the object of the vegetable garden is edible fruit, so the object of the flower garden is bloom. The flowers are raised not to remain undefiled in their allowance of soil, but to be cut—to be cut constantly and in enormous quantities. They are planted, consequently, literally by the acre, and the amount of bloom obtained at any one time is prodigious. The result proves, so it is claimed, that it is possible to plan a large vegetable, fruit and flower garden, in trim paths and symmetrical borders, which can at the same time be economically cultivated.

The roads through the woods are, as I have said, informally

treated, but their informality must not be confused with any lack of intentional effect. The object has been to make a park—not a French park, after the model of the Fontainebleau, but a park which shall keep its native American character. Being a park—by which is intended not a hunting park, a preserve, or a wood-lot, but a woods in which its owner may ride, drive and walk—its original wildness has been somewhat tempered. The woods have been cleared out both for the good of the tall timber and to make them more open and habitable; the sides of the roads have been planted to obtain certain effects; and the whole tract must be compared to a head of hair, which is brushed, if not parted. On the other hand, the planting has been kept thoroughly native and local. There has been no attempt to obtain mere variety of effect by variety of exotic shrubs. The original growth on the tract consisted chiefly of oak and chestnut supplemented by an undergrowth of dogwood and laurel; and the artificial planting has consisted chiefly of thousands of additional laurel and dogwood. Banks of these shrubs line the roads and the uneven contour of the land has offered many opportunities for what will eventually be effective screens and thickets.

The one road whose dressing has been cut on more elaborate lines is the main approach from the lodge up the hill to the house. This road has been planted not only with laurel and dogwood, but at several of the more appropriate places with masses of rhododendrons. Furthermore, it is also distinguished by hedges of Japanese barberry, which, when they obtain their growth, will give it more definition than it obtains at present. Finally it is at the lower end of this road and there only that Mr. Lowell has used some evergreens. The original growth in this vicinity contained a few cedars, which suggested the idea of largely increasing their number, and so enhancing the effect. As the land is comparatively clear in this neighborhood, the cedars are not obscured by any larger vegetation. As one passes through the lodge-gate and drives up the hill they dominate the foreground; and the darker green and prim growth of their foliage makes during the summer months a pleasant contrast with lighter green and more irregular growth of the deciduous trees. In winter, on the other hand, particularly when the snow is on the ground, the cedars will relieve the bleakness of the leafless oaks; and inasmuch as the house is generally occupied until after Christmas, this touch of warmth added to the winter landscape will be grateful as well as interesting.

It will be seen from the foregoing description, as well as from the illustrations, that Mr. Lowell's treatment of "Harbor Hill" has been shaped by one dominating idea. He has sought above all for simplicity and propriety of effect; and in seeking for these simple

effects he has used also only the simplest means. His design is not complicated by many elements. He has used architectural "features" in the vicinity of the house with the same economy that he has used exotic vegetation at the sides of the roads. He has first of all attempted to make his design acceptable by making it fundamentally right; that is, by making it so far as possible the product of its local conditions; and by local conditions is meant in this sense both the lay of the land, the character of the vegetation, and the requirements of the occupants of the house. As the place stands at present, there is very little about it which is merely ornamental; and the ornament which has been used has been used for the purpose of touching up an effect which was already given in the native appearance of the place. Such is the case with the cedar trees along the main road, and with the laurels and dogwood that have been so profusely planted along the other roads. At the same time the attempt to preserve and enhance the natural appearance of the landscape, has not been pushed beyond the limits of propriety. While the woods have been kept natural they have not been kept wild. They have been adapted to human use. So it is with the immediate vicinity of the house. Mr. Lowell has realized that the way to keep the immediate surroundings of a great house simple, is not to make them artificially natural, but to treat them as frankly artificial—as frankly modified to suit the convenience of the inhabitants, their demand for an appropriate framing of the landscape and an effective disposition of the vegetation. Mr. Lowell, that is, with all his preference for the use of simple means in obtaining simple effects, has been formal in his treatment where formality was, if you please, natural. He might, in the opinion of the writer and in consideration of the rather elaborate and pretentious architecture of the house, have used in its immediate vicinity more architectural features, for simplicity of effect can often be wrought—in the greatest works of art has been wrought—by the use of very elaborate means; but it must be remembered that the work on the formal garden, which will be the great ornamental feature of the design, has been as yet scarcely begun, and that consequently any criticism as to the completeness of the effect must be reserved until the landscape architecture of the estate receives its consummation in the pleasure garden. But whatever the ultimate effect may be, Mr. Lowell has undoubtedly supplied to American landscape architects a model of consistency and economy, both of purpose and of means, in the treatment of a large estate which is needed and may well be edifying.

Herbert Croly.

THE RESIDENCE OF EDWIN S. FECHHEIMER.

Winnetka, Ill. Augustus B. Higginson, Architect

A SMALL BUT SPACIOUS HOUSE.

The Residence of Edwin S. Fechheimer, at Winnetka, Ill.

IT is rarely that one finds a small and comparatively inexpensive house which is a meritorius and attractive bit of architectural design, because it is rare that people who want a small and moderate establishment will spend the money necessary to obtain really excellent detail. Excellent detail is very expensive compared to the total cost of a house; but no dwelling can be made individual and interesting without the special and careful designing of the trim, the panelling, the chimney-piece and the like. Consequently, when one finds a small and modest house which is extremely attractive—and attractive because of its sound architecture—one feels like sharing the gratification it occasions with other people. The Fechheimer house, illustrated herewith, is individual and attractive. The reader will see that it is a small frame building, consisting only of one large room, which is ceiled by the slanting timbers of the roof, and an L containing a kitchen and one or two bedrooms below and other bedrooms above. The large room is at once a living-room, dining-room and library; and when one is planning only a small house, it is certainly far more sensible to concentrate the available space in one apartment of ample dimensions and of dignified effect than to divide it into two rooms, neither of which are large enough either for comfort or effective treatment. In the present instance the big room is really spacious. It is high, it is broad and it is wide; and after a meal, the host and his guests can retire to another part of the room without being annoyed by any excessively conspicuous intrusion of the necessary table-clearing. It is not only spacious, however; it is architecturally correct and impressive, and it is at the same time eminently comfortable. The slanting ceiling and the timbers of the roof dominate the room. The lines of these timbers are carried down to the level of the gallery floor by means of strips, while the strongly marked horizontal line made by the gallery is carried around the room by a broad wooden band and a shelf. In the panelling below the vertical lines are still dominant, but much less conspicuously so. The dimensions of the room have enabled the architect to install a big, bold chimney-breast, which is frankly nothing but a chimney and a fireplace, and which is only a mantel piece in so far as it shares the line of the shelf with the walls of the room. The mission furniture harmonizes perfectly with the character of the woodwork, and the color scheme, which is almost of one shade of brown throughout, adds the final touch of propriety. One must congratulate the owner and the architect of the house with securing such a consistent result by the use of such legitimate means.

LIVING-ROOM IN THE FECHHEIMER HOUSE.

Winnetka, Ill. Augustus B. Higginson, Architect.

LIVING-ROOM IN THE FECHHEIMER HOUSE.

Augustus B. Higginson, Architect.

Winnetka, Ill.

LIVING-ROOM IN THE FECHHEIMER HOUSE. Augustus B. Higginson, Architect.

Winnetka, Ill.

"MADE IN FRANCE" ARCHITECTURE.

THE character of American architecture has undergone so many revolutions during the present generation that it is even possible to perform for ourselves the office of posterity, and bring a cold and critical mind to the judgment of things which once seemed beautiful and final, but which the whirling wheel of time has already shown to be scarcely more lasting than "the snows of yester-year."

Tell me, now, in what hidden way is
  Carpenters' Classic, wooden Greek;
What of Eastlake? Where to-day is
  The Italian villa farm-house freak?
  Where for the Neo-Gothic seek?
With Richardson Romanesque, I fear,
  They are gone the way of the sham antique,
For these are the styles of yester-year.

The time is surprisingly short since our architecture was dominated by the personality of one man, Richardson; and architects did their thinking in terms of rough stone walls, high, picturesque roofs, arches with enormous voussoirs, and columns with cushion-shaped capitals. To-day the ideas and principles of the Ecole des Beaux Arts prevail with equal virulence, and quoins, cartouches and bunchy mouldings are the order of the day. *"Project," "ensemble," "esquisse-esquisse," "hors concours,"*—these are the catchwords of the schools, offices, and ateliers from whence emanate architectural confections as Gallic as their prototypes of the Ecole des Beaux Arts itself.

Two questions naturally suggest themselves: Is this latest form assumed by our protean architectural muse only a passing fashion like the others, or is it, in a manner, final? And permanent or ephemeral, does it make for the betterment, or for the debasement of American architecture?

The representatives in this country of the Beaux-Arts idea are organized into a society which numbers among its members many architects of great ability and prominence in their profession, and they have undertaken, at no little cost of time and money to disseminate the principles and methods of work of the Ecole among students of architecture in colleges and offices by the establishment of a travelling scholarship, and by carefully arranged and well-conducted competitions held at frequent intervals, involving the exhibition, criticism, and ranking of the drawings submitted, and the awarding of cash prizes and honorable mentions. The society aims,

in other words, to place freely at the disposal of every ambitious young draughtsman those advantages of education and training which cost its members money, long and arduous preliminary study, the mastery of a foreign tongue, and a more or less protracted residence abroad.

Alexander the Great sent thirty thousand Persian boys to Greek schools and so laid the foundation of the sovereignty of Greek ideas. The Beaux-Arts Society has adopted a similar course to accomplish a similar end; the perpetuation, namely, of the Beaux-Arts tradition in America. It would be difficult to devise a more effective method for the dissemination of a body of ideas than this of impressing them upon the plastic mind of youth.

Several of the leading colleges, also, have Beaux-Arts graduates of distinction in charge of their architectural departments, and the great French school itself is to-day more than ever before the Mecca of American youths dedicated to the study of the art, as is proved by the fact that there are more than twice as many pupils from the United States as from any other country except France itself.

From facts such as these, even more than from the more obvious evidence afforded by those *chic* and brilliant façades, redolent of the Parisian boulevards, which have lately reared themselves along the New York avenues and streets we must conclude that the Beaux-Arts movement is not a purely ephemeral manifestation, since it incarnates not alone in stone and wood and iron, but in the minds of the young men destined to create the architecture of the future.

Such being the case, the second inquiry, whether Beaux-Arts architecture, so called, is a healthy manifestation or the reverse becomes doubly important.

There is much to be said in its favor. Tracing its beginning back to the days of Louis XIV it links the turbulent and mercantile present with the ordered and opulent past. Through it our architecture comes into actual contact with the grand manner of the Renaissance, and so, through "the dark backward and abysm of time" with Rome, with Greece, with Egypt. It stands, however inadequately, for that orderly succession, that continued tradition, for that evolutionary process of selection and survival upon which architecture, more than any of the other arts is seen to depend. Moreover, it is the propaganda of a group of individuals, and not of one man. It is flexible, and accommodates itself readily to the fulfillment of the needs of modern life, being pre-eminently adapted to the expression of the complex, spectacular, and highly organized life of cities. In theory, at least, and in its finest manifestations, it is logical and reasonable, convenience and utility never being sacrificed to effects

of imagined grandeur or picturesqueness, as they were by Richardson and his imitators.

The course of study and the competitive progressive exercises in design prescribed by the school are well calculated to develop a high standard of efficiency in the pupil. The work of the architectural raw recruit is made soldier-like and presentable in a short space of time, and he acquires synthetic habits of thought, and dexterities of execution which forever distinguish him from the self-taught civilian of architecture.

These things are self-evident and generally acknowledged, and any discussion of the true value of the Beaux-Arts training for our young men, and of the influence upon American architecture of the style with which that training is identified, must needs concern itself with issues more obscure and more vital—with the question, for example, whether architecture in so far as it is an art, is not, like the other arts, a thing of feeling and emotion, rather than the product of the reason solely, and whether any school, however excellent, can evoke feeling in a man—whether, indeed, it does not rather destroy it; and even granting that it can evoke feeling, whether it can teach a man to express it in the manner peculiar to himself alone. "Professional schools," says Tolstoy, "produce an hypocrisy of art." What is architecture, in the last analysis, but the manifestation in space—by means of ponderable materials and in three dimensions—of a nation's life and inherent character? This being so, do not those borrowed and inherited forms which constitute so large a part of the architectural language of the Beaux-Arts votaries, however appropriate and indigenous they may be on French soil, become meaningless and exotic when applied to constructions peculiar to America and American life—the skyscraper, for example, and the country house which is neither a villa nor a chateau? Is this not an hypocrisy of art? Why should we constrain ourselves to speak bad French on Broadway? Can the simpering architectural masks which line the boulevards of Paris, or anything remotely resembling them adequately objectify the idea incarnate in the many storied temples of Mammon which rear themselves above the smoke and dust and noise of our volcanic, titanically laboring cities? Can imitations of the chateaux of French nobles, the pleasure houses of kings' mistresses, the villas of cardinals and grand-dukes, however cleverly equipped with electric lights and sanitary plumbing, ever be made fit and expressive dwellings for the self-made Americans who spend by preference the greater number of their waking hours in the hurly-burly of business—cliff-dwellers of the city canyons, waging bloodless but deadly warfare against one another?

Yet architecture is never, in the last analysis, false to the con-

ditions which gave it birth. This imitation of European architecture indicates, and indicates truly, a corresponding imitation, on the part of a certain class, of European modes of life. The stream of our American civilization tends more and more to divide itself into two currents, the one aristocratic: an aping of European society, with its forms, its class distinctions, its luxury, its lavishness, and all the attendant complications of the machinery of living; the other democratic: a reversion to simplicity and sincerity of living. As Mr. Sullivan says, "We are at that transitional moment in our national life wherein we tremble evenly between decay and evolution, and our architecture, with strange fidelity, reflects this equipoise." It so happens that the expression of the aristocratic ideal Beaux-Arts architecture stand inexorably committed. It is a rose which blooms nowhere so rankly as underneath the fructifying sun of Wall Street. The millionaire has marked it for his own. The vitality of much money animates it. The democratic ideal finds expression in the work of a few men in Boston, in Philadelphia, in Chicago—work essentially intimate and individual in character, having few qualities in common except the abjuring of the gradiose.

Money is a most potent and necessary factor in architectural evolution, for architecture is the efflorescence, as it were, of the superfluous wealth of a community or of a nation. It is not a good thing, however, when this superfluous wealth is poured out, nor for the whole people, or by them, but by and for the rich class, and when the tastes and habits of this class are alone catered to.

It is precisely because we are rich that we may hope for the next world-important development of the art of architecture to take place here, rather than in Europe, saddled as it is with an expensive and unproductive military system, and laboring under the added burden of over-population; enslaved, too, in its architectural imaginings, by the very perfections of those monuments left by its vanished systems and civilizations, in which the pursuit of beauty was as active and ardent as the pursuit of scientific knowledge is to-day. Up to the advent, a few years ago, of L'Art Nouveau modern European architecture consisted of the reassembling in new combinations of the outworn classic forms, modified, perhaps, but modified by the whim of the designer rather than by structural necessity,or perchance distorted into those degenerate Baroque like shapes reminiscent of nothing so much as the creations of an ambitious confectioner, known as "Modern French." In this exercise the Ecole des Beaux-Arts undoubtedly renders its pupils proficient, and in monumental work and buildings of the accepted and conventional type the results are sufficiently pleasing to the eye, at least. The ingenuity of the American architect of Beaux-Arts training is severely taxed, however, when it comes to adapting the

school canons of design to certain unprecedented structures born of American needs and embodying new methods of construction. That he sometimes succeeds so well is rather a triumph of his ingenuity than of that innate perception of the fitness of things so essential to good architecture. His failure, if failure it may be called, is the more to be deplored for the reason that these unprecedented constructions are the very ones in which the national genius attains its intensest objectification. If he only knew it, it were better to cut the Gordian knot than laboriously to unite it, but this seems equally beyond his comprehension and his power. Hypnotized by his school training he willingly bows to a yoke which is not his by inheritance—one which some of the most advanced European architects are themselves striving to throw off. Herein he is false alike to the spirit of his native country, to which he fails to give adequate utterance, and to his art, which he fails to enrich and vitalize by bringing it into organic relation to current methods of construction.

I characterized the Beaux-Arts training as a yoke, and so it is, but just as the stalled ox leads a more comfortable and less precarious life than its free-roaming brother, so the loyal disciple of the school is usually better off than he who, alive to the inadequacy of the architectural language which the school teaches, essays to formulate another, for it is in the nature of the school—of any school—that it makes easy the way of the man of mediocre talent by guarding his feet from the pitfalls which beset the path of the innovator. It encourages its disciples to lie down in the green pastures of the past, tilled by the labors of those who have gone before; it leads him beside the still waters of things accredited and accepted. The schoolman has the conservative majority always on his side. His work may not be wonderfully good, but it need never be wholly bad, and it is almost always fashionable. The innovator, on the other hand, cannot conceal the poverty or vulgarity of his thought behind a borrowed mask; he must create, and even though he be a genius, and invents new forms of beauty, he has still the natural and instinctive conservatism of public taste and opinion to overcome, and though successful also in this his practice must necessarily be restricted to the amount of work he can himself attend to; he cannot put into operation that system of designing by card catalogue, as it were, which is so successfully practiced in offices dominated by the Beaux-Arts idea—a system whereby the various details of a building are designed, or more often copied out of a book, by various hands, and without serious loss to the homogeneity of the whole.

The strictly commercial basis upon which a successful architectural practice is conducted nowadays, and the great volume of

work turned out by a single office are factors favorable to the dissemination of Beaux-Arts methods, because it creates a demand for men trained in "established" architecture who are able and willing to merge their own individualities in the larger individuality of the firm for which they work, in the same way as a newspaper writer loses his identity in his paper.

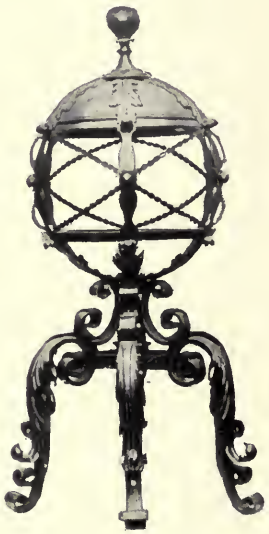
Nowhere in the world are building operations undertaken on so vast a scale as here in America, and nowhere is there so much money spent, and so much popular interest manifested in building. There are sufficient numbers of men of distinguished talent in the profession to render our architecture, under these circumstances, illustrious in the history of the world. False ideals, lack of initiative, and a misplaced conservatism, however, delay this consummation. It has been said that "in the mind-history of every land there is a time when slavish imitation is inculcated as a duty, and novelty regarded as a crime," and it would seem as though we were passing through that phase of our development in the field of architecture, at least. The only American architect of eminence who by precept and example stands for originality—not eccentricity, but invention wedded to reason—is a prophet not without honor save in his own country if we except the small circle of his disciples and admirers. His is personality so positive and a talent so unique that I may be pardoned for mentioning him by name. I refer to Mr. Louis Sullivan of Chicago. He stands so uncompromisingly for the democratic, as opposed to the aristocratic idea, for naturalism as opposed to scholasticism, for invention as opposed to imitation, that in his work and in his propaganda he may be said to epitomize and embody the anti-Beaux-Arts spirit, as that spirit has come to be understood from its interpreters in this country. By a curious paradox Mr. Sullivan received his training at the Beaux-Arts, and acknowledges a great indebtedness to the school. He purports to embody in all his work its essential teachings, and the best foreign critics take this view. To them Mr. Sullivan is the foremost, the only distinctively American architect, but the Beaux-Arts votaries in this country are far from sharing this opinion of him. To them he is rather an anarch of art, a brilliant iconoclast, an individualist, as was Richardson, with an influence less subversive only because it is less widespread. He, on his part, is scornful of them, and his caustic pen is never more bitter than when assailing their pretensions. "The recent American students," he says, "return from school equipped not with a knowledge of first principles, but merely with a collection of clever fads and tricks. How much of this is due to be charged to the school, and how much to the material and opportunist temperament of the average American student I am not prepared to say."

Here is an apparently irreconcilable antagonism between men of the same country, the same profession, the same training, significant of the confusion of ideas now prevailing on this subject. No marshalling of arguments can avail in predicting which way the cat will jump—what form our architecture will ultimately assume, but it is evidence that there is a segregation of forces into two opposite camps, the one represented by what I may call the New York group, in which the Beaux-Arts spirit is dominant, and the other by the Chicago group, inspired by Mr. Sullivan. Just now the former is in the ascendant, but there is a vital and germinative quality in Mr. Sullivan's propaganda, a freshness, an enthusiasm, appealing to the spirit of youth. I know nothing more inspiring to the American architectural student than his "Kindergarten Chats" notwithstanding their prolixity, their errors of taste, their spirit of intolerence and bad-temper, and Mr. Sullivan's office buildings are eloquent object lessons in original beauty, sincerity, and directness —lessons which are being pondered in unexpected quarters as the altered character of much of the recent work in this field shows.

Although these two factions are at odds just now, it is to be hoped, and not impossible to be imagined that the coming generation of architects may achieve a larger synthesis in which the two divergent ideals may be reconciled to their mutual enrichment; the devotees of sheer originality learning from the schoolmen that temperance and restrait and refined feeling for beauty which the study of classic architecture inculcates and that masterly way of handling a given problem which the solution of many imaginary projects teaches; and the schoolmen being inspired in turn to armore constant effort at creation and invention.

As a final work it may be said that the demand for a school training, and more particularly for a Beaux-Arts training for American architects and draughtsmen has arisen in answer to a very real need and has therefore a validity which cannot be argued or ridiculed away. Our sorry experiments at archaic architecture and our sorrier essays in originality have impressed the more enlightened with the necessary for some form of official architecture, as it may be called, for important public buildings at least, which, however little inspired, may at least not offend the sight, and the Beaux-Arts movement has helped more than anything else to such a consummation. Our government buildings, libraries and schools built in recent years, though vitalized by no spirit of new beauty compare favorably with those of any other country and are infinitely better than the dread abortions of the pre-Centennial period. However little some of us may like the net visible result of the Beaux-Arts movement, we should be grateful for what it has saved us from. Two things it has at least accomplished: it has taught our archi-

tects the necessity of *ensemble* planning, and it has immeasurably raised the standard of draughtsmanship. The one discouraging factor of the whole matter is that the Beaux-Arts votaries are attempting to make what should be regarded as transitory final; their one idea seems to be to continue to give us what they have been giving "only more so." Their ideal is still the old world ideal, they do not seem to seek for a valid meaning in all they do. They seem to regard it as unthinkable that to the future historian of our architectural evolution the Beaux-Arts movement of to-day may well appear the infatuation of a small circle attempting to make the building impulse of a great nation revolve upon the frail axis of a foreign school. *Claude Bragdon.*



ARCHITECTURAL REFINEMENTS IN FRENCH CATHEDRALS.

THIRD PAPER.*

Notre-Dame.

THE observations to be described in this paper and in its continuation in the January Number, were made mainly during the month of September, 1903. They are verified by photographs, in which the perpendiculars are represented by plumb-lines, and in which the dimensions are indicated by the inclusion of a surveyor's rod in the picture.

The entire number of negatives made in Notre-Dame to illustrate these observations was eighty-five. Sixty-three of these were interiors.

Of these photographs, forty-five have been enlarged to the dimensions of 25 in. by 35 in., or 18 in. by 22 in., and twenty-eight of them have the larger dimensions. They are now on public exhibition in the Brooklyn Museum. They are catalogued in a printed commentary, which has been published as a Museum Memoir.† In this Memoir, which appeared in April, 1904, the facts which are now to be described in a more categorical and more detailed manner were very briefly made public in print for the first time.

List of Illustrations.

Fig. 1 is a rough sketch of the north side of the nave of Notre-Dame, between the transept and the organ loft, showing arrangements which also appear on the south side. Figs. 2, 3 and 4 are photographic details relating to portions of this sketch, showing accurately the features which are exaggerated by it.

In the Brooklyn Museum exhibit there are fifteen photographs showing in greater detail the special facts which are in question in this limited number of illustrations, all but two of which are 2 ft. by 3 ft. each, inside measure.

Figs. 5 and 6 are reproductions of previously published surveys of the Pisa Cathedral, showing arrangements similar to those of Notre-Dame.

*Continued from the November Number. The illustrations of these papers are from photographs of the Brooklyn Museum Series of 1903.

†Memoirs of Art and Archæology, No. 4: "Vertical Curves and other Architectural Refinements in the Gothic Cathedrals of Northern France and in early Byzantine Churches at Constantinople." (Macmillan.)

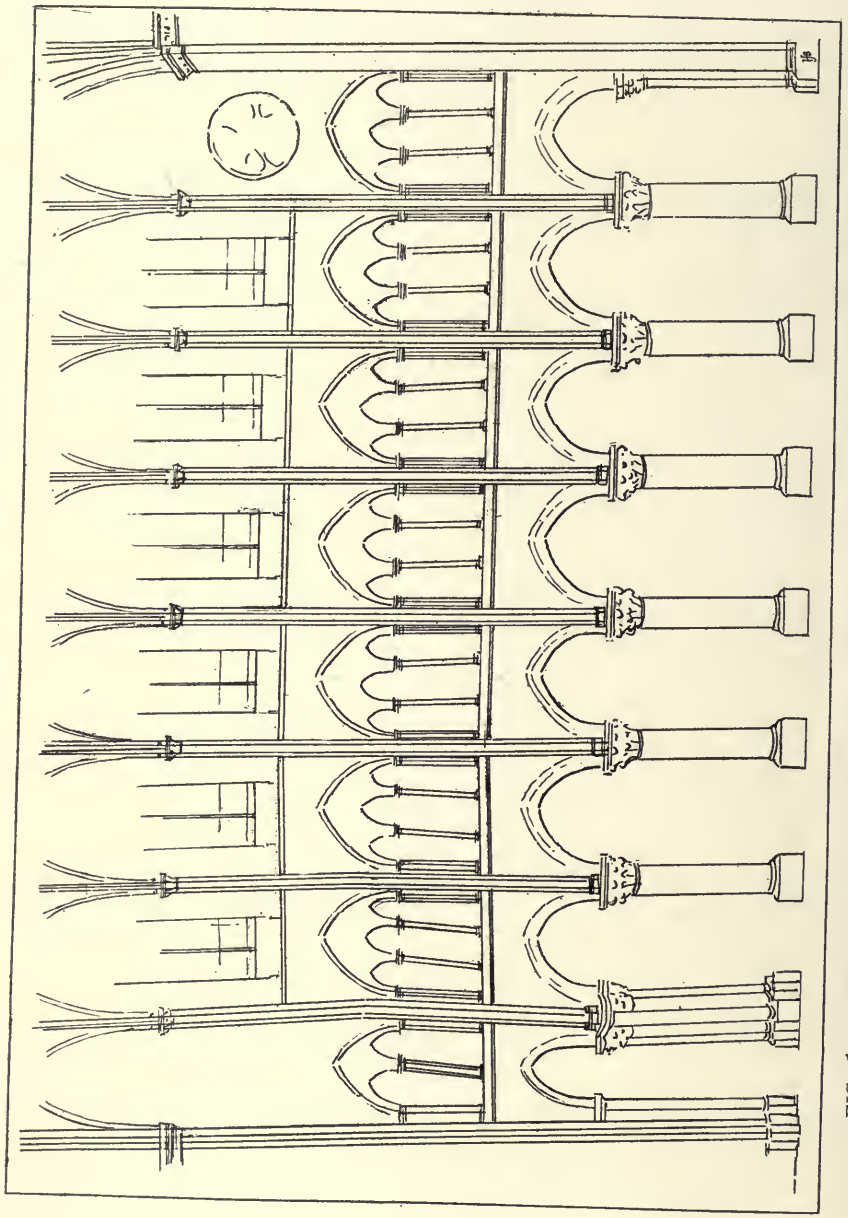


FIG. 1.—ELEVATION, IN EXAGGERATED DRAWING, OF THE NORTH SIDE OF NOTRE-DAME.

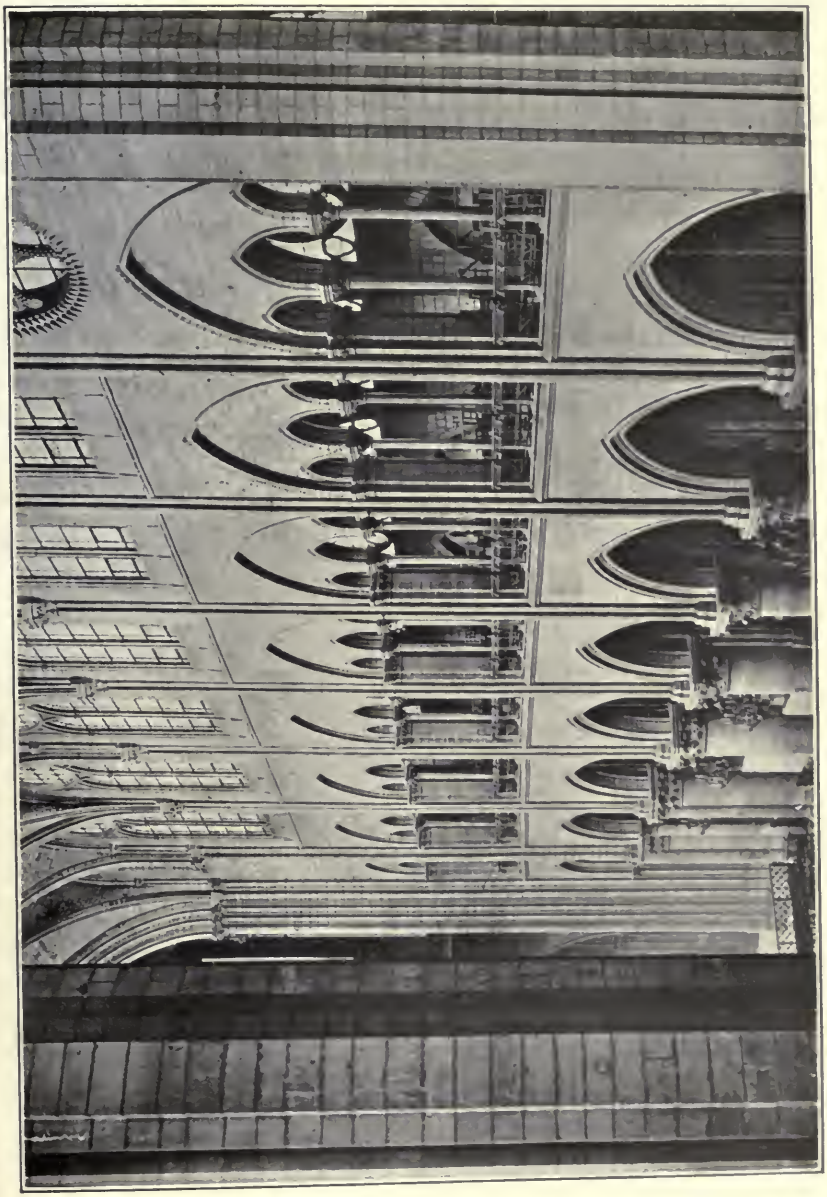


FIG. 2.—NOTRE-DAME. LEFT (NORTH) GALLERY, FROM THE CHOIR.

FIG. 3.—SOUTH GALLERY, NOTRE-DAME. SEVENTH BAY, COUNTING FROM THE TRANSEPT.

The Gallery Bends in Elevation.

We will first devote attention to the gallery bends in elevation, one of which is roughly shown in Fig. 1 and accurately shown in Fig. 2. This bend is found in both galleries in the same relative position, and having the same general character, with measurements which are practically identical. In Fig. 3 its rise is shown for three bays of the (farther) north side and for one bay of the (near) south side. Fig. 4 also shows the rise of the parapet for one bay of the (near) south side, next the organ loft.

In this picture the cutting and fitting of the masonry, by which the rise is effected, can also be seen quite clearly on the farther side of the nave. In the Brooklyn enlargement from the same negative, and in other enlargements, the cutting and fitting of each individual block of masonry are shown with the greatest clearness.

The amount of the gallery bends in elevation in Notre-Dame was tested by level, in the south gallery. In the north gallery the stationary benches, which have been placed there for use on ceremonial occasions, made the use of a level impossible, and the measurement was taken by plumbing to the pavement below at three points; viz., at the bend, and at the two extremities of the gallery. As I did not take the level of the pavement below, the measurement for the north gallery bend must be considered as an approximation, but the best which is possible at present.

According to these measurements, the north gallery parapet rises 0.95 (or 11½ inches) in the first three bays, counting from the organ loft. From that point it bends abruptly to an approximate level, but rises .08 in the remaining five bays (assuming the pavement below to be accurately level).

By level, the south gallery parapet rises 0.85 (or 10¼ inches) in the first three bays, and falls 0.28, toward the transept, in the remaining five bays. The gallery floors correspond to the parapets in general change of level.

On the north side the capitals of the triforium, and the window-sills of the triforium, follow the same bend, but I cannot observe it in the sills of the clerestory windows or in the string-course under them.

On the south side the bend is repeated in the line of capitals of the triforium, in the triforium window-sills, in the sills of the clerestory windows and in the string-course under them. The bend in this clerestory string-course and in the line of window-sills in the clerestory has been entered by our artist in the rough sketch, Fig. 1, in order to economize cuts; although it is really found on the other side of the church.

The verification of the facts stated regarding the clerestory win-

dows on the south side, and for the corresponding string-course, may be accomplished by a trip to Brooklyn, where the visitor will find, not only a 2 by 3 ft. counterpart to Fig. 2, for the south side, but also a 2 by 3 ft. detail for the bend in the string-course of the south clerestory wall (No. 94 of the Catalogue).

The bends described are wholly invisible from the pavement of Notre-Dame. From this position they are discounted insensibly into the ordinary effects of perspective. That they very much add to these effects is beyond dispute. In the galleries of Notre-Dame the bends are also easily overlooked, and here again they are naturally discounted into optical effects.

No. 75 of the Brooklyn Museum exhibit illustrates the tendency of the eye to discount these deflections. When the picture is viewed in the normal position one does not notice any change of direction in the line of sills of the triforium windows. If the picture is turned sideways, and the line of window-sills is sighted by holding the view in a diagonal position, the very pronounced bend is easily seen.

That these deflections are not due to accidental movement of the masonry may be gathered from the inspection of the enlargements in Brooklyn, which show the cutting and fitting of the masonry, all the blocks of which, under the parapets, can be individually seen in the photographs. That they are not due to masonry movements may farther be gathered from their close uniformity on the two opposite sides of the church and from the mentioned fact that they are found in a series of repetitions, including on the south side the clerestory string-course and the alignment of the window-sills.

Even in the half-tone prints of this article (Figs. 3 and 4), the individual blocks of masonry may be fairly well distinguished. In the numerous enlarged details of the Brooklyn Museum exhibit, the great magnitude of the pictures and the sharp definition of their details furnish an opportunity to trace the entire process of the construction of these bends, not only beneath the parapets, but also in the clerestory walls, up to the height of the vaulting-shaft capitals; including about one-half the height of the clerestory windows.

Nothing similar to these gallery bends has been noticed in other French cathedrals as far as visited.*

Their exact counterparts, as regards system, occur at Pisa.

Fig. 5 represents a survey, made under my direction in 1895, of the north gallery in the Pisa Cathedral. The north parapet rises from the façade 0.78 for the first three bays. It falls 0.93 toward the transept in the next seven bays.

*A complete list of these cathedrals will be found in Museum Memoir No. 4.

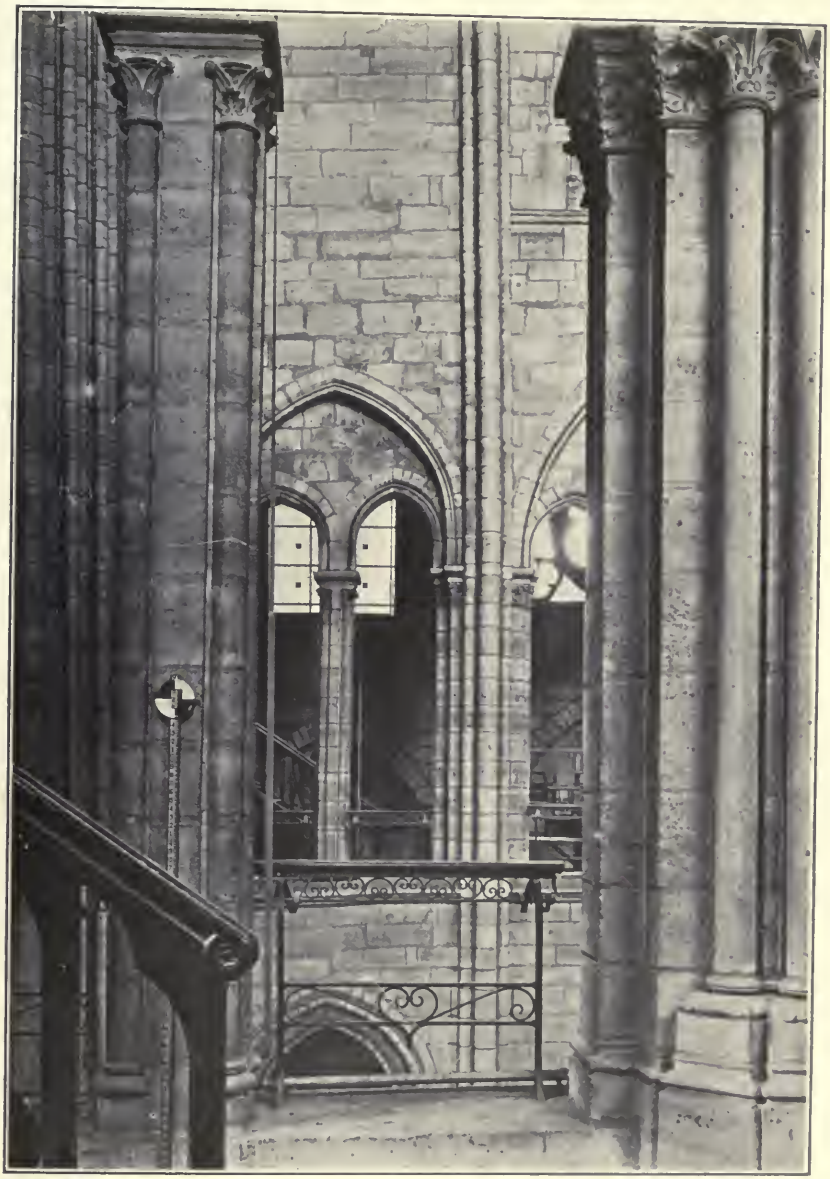


FIG. 4.—SOUTH GALLERY, NOTRE-DAME. EIGHTH BAY, COUNTING FROM THE TRANSEPT.

Fig. 6 is a survey of the south gallery at Pisa. The south parapet rises from the façade 0.83, for the first three bays. It falls 0.83, toward the transept, in the next seven bays. The Pisa bends were originally published in my paper on "Constructive Asymmetry in Mediæval Italian Churches," in the Architectural Record for March, 1897, Vol. VI., No. 3. They have been verified as constructive by Signor Annibale Messerini, engineering architect in charge of the cathedral in 1901, and his certificate has been published.*

The Triforium Columns.

We will now return to Fig. 1, in order to observe a second feature which is indicated in its exaggerated drawing; viz., that on both sides of the church the triforium columns (as distinct from the triforium piers, which are connected with the vaulting-shafts) lean together toward a common point, which is the apex of the bend.

For the first three bays, on both sides of the church (counting from the organ gallery), the triforium columns lean east (to the right). For the remaining five bays, on both sides of the church, these columns lean west (to the left).

On the other hand (see Fig. 1), the piers and vaulting-shafts lean uniformly west (to the left) from transept to façade; but they make a concession to the opposing leans of the triforium columns in the first two bays, as far as the corresponding height is concerned, and beginning lower down. They compromise, so to speak, with the opposing lean, and then return to their own system.

This compromise bend, which is found on both sides of the church (but which is most strongly defined on the north side), is roughly shown in Fig. 1. It is accurately shown in Fig. 4. In Fig. 3 we see the columns, from which plumb-lines are suspended, leaning east (to the right), and we see the vaulting-shafts, across the nave, leaning west (to the left). In Fig. 4, the westward pitch of the great pier next the organ loft is well shown on the extreme left, and in the centre of the picture we note the return bend of the vaulting-shart to the left (westward), in the clerestory wall; whereas, for the height of the triforium arcade its inclination westward (only 0.03 in 10½ ft.) does not contrast abruptly with that of

*Architectural Record; Vol. XII., No. 6, Nov., 1902; Am. Journal of Archæology, New Series, Vol. VI., No. 2; Museum Memoirs, No. 1.

The irregular heights of the columns in the nave are due to their heterogeneous origin; but, although the columns of the galleries are also of irregular size, the gallery piers have been systematically constructed in varying heights, which form a bend on the south side and a gradually descending line on the north side. For the farther encouragement of sceptics, it may be added that the string-courses on the exterior sides of the Pisa Cathedral, which correspond to the general level of these gallery parapets, do not bend at all. They fall at an even rate from the façade toward the transept, to the extent of 2 ft. This proves that the interior deflections were not caused by some change of plan during construction, such as the lengthening of the church might have involved.

the adjacent column, leaning east 0.14 ft. Lower down and beginning at the base of the pier the westward lean is very pronounced; at the rate of 0.37 in 20 ft.; and this is also the rate of pitch above the triforium arcade (the view of the pier and vaulting-shaft from the pavement up to the parapet is shown by No. 97 of the Brooklyn exhibit).

In Brooklyn there is a series of photographs similar to Fig. 3, each 2 ft. by 3 ft. in size, one for each individual bay of the south gallery, looking through it to the vaulting-shafts and bays of the opposite side of the church. There are also four enlargements, looking from the north side to the south side of the church, showing that the facts are uniform for both sides, as regards the vaulting-shafts.

It appears, from the compromise bend in the vaulting-shafts, which would otherwise conflict too distinctly in their westward inclination with the eastward leans of the triforium columns, that two distinct lateral systems of optical or asymmetrical arrangement have been employed in the nave of Notre-Dame, which had to be harmonized in this manner, in order to avoid an abrupt contrast of vertical lines, leaning in opposite directions, in the bays next the organ loft.

It also seems evident that the inclinations of the triforium columns towards the apex of the bends are connected with the system of these bends, and it may be presumed that the inclinations were intended to accent and develop their effect, as seen from the level of the pavement below.

Vaulting-Shafts of the Nave.

The westward leans of the vaulting-shafts, including the piers, from the pavement up, which are slightly exaggerated in Fig. 1, are a separate affair, and belong to a distinct system, because they are uniform in the direction of their inclination, from transept to façade. As a tentative suggestion regarding the purpose of this arrangement, it may be noticed that its optical effect, in the direction from the main entrance to the choir, would be to increase the appearance of the widening which is described in the November paper. It would, therefore, be a plausible, tentative explanation that, over and beyond the slight actual widening in the clerestory of the nave, this expedient had been employed as preferable to a more pronounced actual widening, which might have been considered as going beyond the limits of constructive safety. It is a possible objection to this suggestion that there would be an inverse result in the opposite direction, but there are many mediæval churches in which perspective illusions have been arranged in the

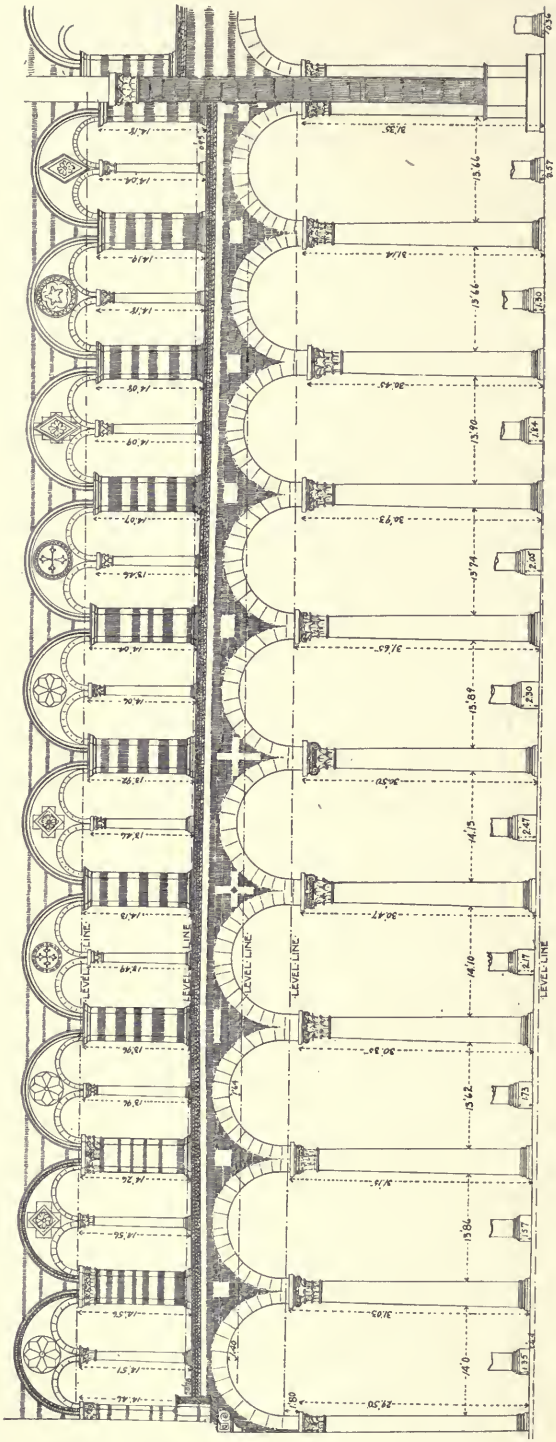


FIG. 5.—PISA CATHEDRAL. SURVEY OF THE NORTH GALLERY BEND IN ELEVATION.

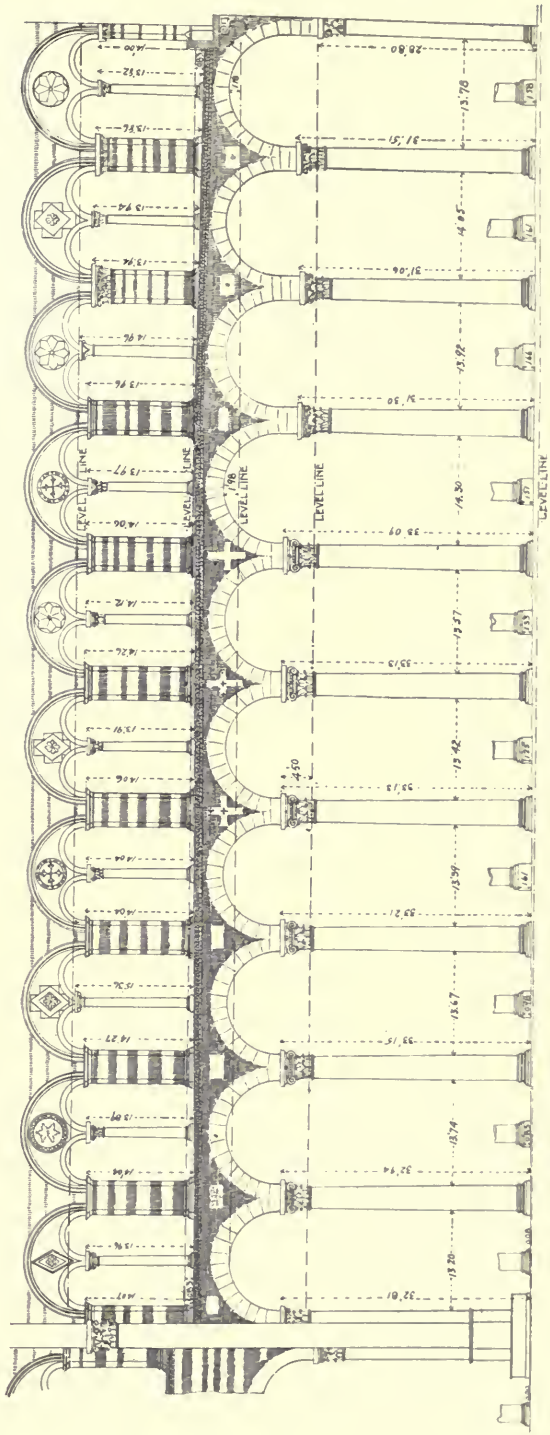


FIG 6.—PISA CATHEDRAL. SURVEY OF THE SOUTH GALLERY BEND IN ELEVATION.

direction from entrance to choir, which work inversely in the opposite direction. In a Catholic church the eyes of the worshipper and very often those of the spectator are mainly turned toward the choir. Effects from the direction of the main entrance, or during worship, may have been considered the most important.

For the moment the facts appear to be more interesting and curious than any possible theory about them can be, and the essential fact is, at present, that this very remarkable asymmetric construction exists in Notre-Dame.

Plumb Measurements for the Triforium Columns.

The plumb-lines which are seen in Figs. 3 and 4 were actually broad tapes, because this width was considered desirable, as a means to their prominence in the photograph. For the measurements which follow, a light cord (10½ ft. in length) and a heavy plumb-bob were used. The object of quoting these measurements is to exhibit that uniformity of arrangement which demonstrates the existence of a definite and carefully conceived plan, whatever that plan may have been.

In the following list of plumb measurements they are quoted by bays, counting the "first" bay as the one nearest the transept and the "eighth" bay as the one next the organ loft. In this list only the triforium columns are mentioned, two for each bay; the piers of the triforium, which are connected with the vaulting-shafts, being omitted. These uniformly lean west, according to measurements which have been published in Museum Memoir No. 4.

Plumbs for the Triforium Columns.

North Gallery.		South Gallery.
.05W	1st Bay	.03W
.10W	....	.04W
.10W	2nd Bay	.07W
.12W	....	.14W
.06W	3d Bay	.14W
.11W	....	.15W
.06W	4th Bay	.13W
.07W	....	.13W
.04W	5th Bay	.13W
.05W	....	.11W
.04E	6th Bay	.20E
.00	....	.03E
.18E	7th Bay	.25E
.24E	....	.12E
.14E	8th Bay	.10E

It is understood that the facts represented by these measurements are shown in an easily visible and rough approximation in Fig. 1, and that they are accurately shown for two bays, viz., the

eighth and seventh, by Fig. 3 and Fig. 4. It is also to be understood that the facts are accurately shown for every individual bay by photographs, of size 2 by 3 feet, in the Brooklyn Museum.

It is evident that the correspondences in the direction of these leans, and in their change of direction, on the two sides of the church, as related to the apex of the bend on both sides of the church, is such as to make the suggestion of accident or carelessness too improbable for consideration. To argue this point would be to insult the intelligence of the reader.

As regards the suggestion of acidental masonry movement I ought, however, to remember that such theories are occasionally held by persons who evidently have not grasped all the facts which are involved in the given problem. Let such persons understand here what is the problem which *their* theory of the unlimited plasticity of cathedral masonry has to grapple with. In the "sixth," "seventh" and "eighth" bays all the columns lean east, but in these same bays all the piers lean west (individual measurements for the piers in Memoir No. 4) and this holds of both sides of the church. For instance, the column of the eighth bay, north gallery, which is mentioned in the list as leaning east 0.14 in 10½ ft., is only 3½ ft. distant from a pier which leans west 0.20 in 10½ ft.

Thus we are led in the next place to describe more carefully the westward leans of the gallery piers and of the vaulting-shafts of which they are portions.

Westward Leans of the Vaulting-Shafts.

The vaulting-shafts of Notre-Dame are best shown in their general relation to the architecture of the church by Fig. 2. In this cathedral they rest on the capitals of the piers and rise from them to the ribs of the vaulting. Their westward leans are also found in the piers, and are, therefore, continuous from pavement to vaulting, as roughly shown by Fig. 1.

The piers of the nave, as distinct from the vaulting-shafts, will presently be considered, but, for the moment, our attention may be devoted to the vaulting-shafts alone, and for the reason that their arrangement carries with it its own proof of constructive intention. Masonry is neither putty nor india-rubber, and the vaulting-shafts, as distinct from the piers below them, are, for large portions of their length, fixtures in a wall, on the surface of which they are simulative and decorative supports, which are not exposed to any east and west (lateral) movement. It therefore follows that eighteen of them (nine on each side of the church) could not all lean in one direction in lines rising from the pier capitals to the vaulting, except by a constructive intention which must have had a fixed purpose of some kind or other.

The question, for the moment, is therefore—do these vaulting-shafts actually lean as they are asserted to lean, and as they are represented to lean, in exaggerated drawing, by Fig. 1?

The answer is furnished in the Brooklyn Museum by eleven photographs, in which the facts can be tested by plumb-lines; nine of these photographs being 2 by 3 feet in dimension. Of these photographs two are shown in the inconspicuous size which is necessary for the page illustrations of this article, by Figs. 3 and 4. In these two pictures the leans of the vaulting-shafts on the south side of the nave are to be tested by the plumb-lines which are hung from the columns in the foreground. Note, among others, the great vaulting-shaft on the extreme left of Fig. 4.

The total amount of the westward leans for piers and vaulting-shafts near the transept and in the center of the nave would appear to be only about 6 or 8 inches (minimum estimate), but it must be remembered that in optical appearance this would add considerably to the widening effect of the nave, when looking toward the choir. Near the entrance the pitch of the inclination increases greatly, especially in the great piers next the organ loft (as shown in Figs. 1, 3, 4). These belong to the tower constructions, and facts of so remarkable a character are here in question that a separate and special account of them must be given in the following article. In this following paper it will be shown that the lower façade leans forward by construction and that the buttresses of the tower constructions follow this lean and then curve to the perpendicular, so that the towers themselves are perpendicular. It will then appear that the leans, which have just been mentioned, of the great piers at the organ loft, which also curve toward the perpendicular, are parallel with those of the exterior tower constructions, of which they form the interior angle supports.

As plumbed from the pavement the piers in question lean 0.44 in 20 ft. As plumbed in the gallery they lean respectively (south) 0.14, and (north) 0.20, in a height of 10½ ft. That the entire amount of lean is about 18 inches is apparent from the following considerations, although these piers have not been plumbed for the entire height and this would not be an easy matter. The height from bases to capitals is close to 80 ft. The pitch is visibly uniform, aside from a curve toward the perpendicular near the top. Since the lean averages about 0.20 in 10 ft., as tested both in the gallery and from the pavement, it appears that 18 inches is a conservative estimate for the entire amount.

Aside from the demonstrations to be offered in the next paper that the leans and bends of the facade and towers cannot be accounted for by settlement, it now remains to be shown that settle-

ment cannot account for the leans of the piers of the tower constructions.

If these piers went over by a settlement of the west front, it was before the weight of the towers was placed upon them, for the towers are perpendicular. Pending publication of the next paper this fact may be verified by inspection of the photographs in Brooklyn. An inspection of the masonry of the clerestory walls will, show, however, that no settlement has occurred. This inspection is verified by photographs in which every block of masonry can be separately studied. If the piers went over 18 inches, there must have been fissures to the amount of 18 inches and the subsequent repairs by which these fissures were filled in would appear in the walls. No such repairs are to be found. On the contrary the intact construction by which the masonry was inclined downward in parallel courses, with the slope at right angles to the leaning piers, can even be studied in the small dimensions of Fig. 3. Note the downward slope of the course of masonry which runs directly over the two triforium arcades on the right in Fig. 3. It may then be suggested that a settlement began at the fourth bay. There are three separate proofs that it did not.

(a) In Fig. 3 a magnifying glass will show more clearly, what can fairly well be seen by the naked eye, that the course of masonry under the fillet which marks the clerestory window sills is cut in gradually narrowing width so as to level and equalize the slope below. In the large photograph of the Brooklyn exhibit which corresponds to Fig. 3, this fact is conspicuous. In the large photograph of the Brooklyn exhibit which joins with Fig. 3 (No. 88), the construction by which all the masonry courses are brought to a level is clearly visible. Similar constructive arrangements of the masonry can be studied in the Brooklyn photographs of the south clerestory walls (Nos. 92-95), with the difference that on this side the fillet is bent constructively. According to the slopes of the masonry courses on both sides of the church, if a settlement took place at all it must have begun at the fourth bay from the organ loft (fifth from the transept), and at this point therefore the greatest fissures must have been filled in. But exactly at this point is found the evidence for the deliberate construction of a bend in the masonry courses.

(b) If the piers of the tower constructions went over by a settlement beginning at the fourth (gallery) bay and indicated by the bend in the gallery parapet (Figs. 1, 2, 3) then the capitals of the nave piers would repeat this bend. On the contrary they are level (Fig. 2).

(c) If the piers of the tower constructions went over by a settle-

ment beginning at the bend of the fourth (gallery) bay, then the pavement and the bases of the piers would slope down to the west to an amount corresponding to the amount of the bend. That this is not the case is shown by the plumb to the pavement from the north gallery.

Before abandoning the subject of the downward slopes of the masonry courses in the "sixth," "seventh" and "eighth" bays (next the organ loft) it should be noted that these slopes and that of the gallery parapet all meet the lines of the great piers leaning west, at a right angle (see Fig. 3). It is this arrangement which makes it difficult to detect or estimate their leans. The bend at the fourth bay is easily overlooked because it is an obliquity which corresponds to the ordinary facts of vision. But if the bend and the slope are not realized by the eye then the leaning piers, which are normal in relation to them, must also escape detection. The north and south walls of the Pisa Cathedral have similar bends in their masonry, with similar relation to the lean of the lower portion of the Pisa façade, and it may not be amiss to remind the reader that the demonstration which has been accepted by the expert in charge of the Pisa Cathedral, and other experts, in Italy, for the constructive lean of the Pisa façade is closely analogous to that which is now offered for the piers of the tower constructions in Notre-Dame.

An Answer to Criticisms of the "Builder."

In his issue of Aug. 13th, the Editor of the London "Builder" has made some adverse criticism on my article in the August Number, and has quoted Peterborough Cathedral as an instance showing that a vaulting may spread 2 ft. without collapsing. He says: "At Peterborough, as we all know, the piers have moved more than 2 ft. out of perpendicular, but the vault did not actually fall in, although it was in a very precarious state before the recent restoration."

"As the nave of Peterborough is not vaulted, and never was, Mr. Statham's instance appears to be poorly chosen, and especially so when we consider Mr. G. L. Pearson's Report on the West Front of Peterborough Cathedral, which he repaired.

We extract the following passage from Mr. Pearson's report:*

"Careful plumbing has determined that the detached clustered columns [of the west front], with the part up to the string-course above them, lean out to the extent of fully 2 ft., and that the three gable-ends have an inclination in the same direction of about 6 in.

*Quoted from the American Architect of June 29, 1895; as copied from the Building News.

Upon looking for the effect of such a divergence from the perpendicular of these pillars upon the work inside the arcade, *one is surprised to see how little there is to indicate that such a great movement has taken place, for, instead of huge gaps in the groining* [of the entrance porch] *which one would have expected to see, there are only—so far as can be discerned from the ground—some slight openings in the cells.* Coupling this fact with the fact that the three gables lean over at a less angle than the pillars below them, and that some of the work in connection with these gables inside the roof is nearly perpendicular, I am disposed to think that the pillars began to settle and lean outward at a very early period, even perhaps before the gables were erected, *and certainly before the groining of the arcade was put in.*"

It thus appears that the instance invoked by Mr. Statham is misleading and worthless, and that it is the opinion of the expert who knows most about the matter that the vaulting of the porch is later than the leaning piers. (The passages in italics are thus marked by me.)

We will now put a hypothetical case. Supposing that I were to lay before Mr. Pearson the measurements and photographs which have been made of the leaning and bending façades of Notre-Dame and Pisa and other similar façades. Supposing that in the light of these observations and of his own, as just quoted, he should determine that the bending façade of Peterborough had been purposely so constructed, and supposing that he should put himself on record to that effect—would it be honest and fair of Mr. Statham to suppress that fact in debating the question as to whether the façade of Peterborough had been purposely so constructed. This is an exact parallel to what the Editor of the "Builder" has actually done in the case of the Church of St. Quentin. Knowing that M. Benard, the architect who was in charge of the repairs of that church for 36 years, is on record as having considered the widening of that church to be constructive, Mr. Statham has deliberately suppressed that fact, in order to make more probable his own hypothetical explanation, manufactured at a distance from the building and without personal examination of the construction in the light of the facts which I have published.

The controversy of Mr. Statham against the existence of a constructive widening system in the vertical lines of mediæval churches, which I have announced for some fifty churches in Italy, France and at Constantinople, moves from the trivial fact that there are tie-rods in the vaulting at St. Quentin. According to my present memory, assisted by many photographs, out of the fifty odd churches which have been found to exhibit the widening, there are only two which exhibit tie-rods, viz., at St. Quentin and in S.

Lorenzo at Vicenza. If these cases of widening were proven to be accidental, it would not affect the great number of other churches which have no tie-rods; least of all the notable case of S. Mark's at Venice, as verified by an expert's certificate, the existence of which Mr. Statham is also careful not to mention, although it was known to him.

The matter of the tie-rods at St. Quentin's is trivial in itself, but, as treated by the "Builder," it denotes an error of logic which is not wholly confined to its Editor. It is significant of certain methods of architectural restorers and of certain prepossessions in the matter of repairs, which have been universal in the last three centuries.

Since the time when the tradition regarding the widening system was lost, in the decay of Gothic architecture and in the Renaissance reaction against the Gothic, it has been natural that all the ordinary and inevitable signs of decay and weakness in mediæval churches should be connected with that supposed evidence of decay which was found in the leaning verticals, wherever these have existed and were taken note of. These have naturally been considered as accidental, and have consequently appeared to be the cause of all other disorders.

In the next place, it is manifest that no vaulted building is exempt from the disrupting tendencies of thrust, and it is equally manifest that buildings originally constructed with spreading verticals are not thereby guaranteed against the ordinary effects and results of these disrupting tendencies. Hence, whenever an original constructive widening has been accented and increased by accidental causes, it has been natural that the actually accidental effect should be considered as indicating the one and only explanation and cause of the entire supposed deformation.

Tie-rods, therefore, prove absolutely nothing in a contention that given deformations were wholly accidental. They may show simply that the restorer mistook constructive arrangements for accidental deformations, or they may show that constructive divergences have accidentally increased to a dangerous extent, or they may show that other accidental deformations have been attributed to the wrong cause—viz., to a constructive widening.

Thus I differ radically with Mr. Statham when he says of me: "If he had found evidence that they [the tie-rods] were ancient, it would have made short work with his theory."

If the church of St. Quentin was built with diverging piers (as held by M. Benard), does that argue that the building was guaranteed from the consequences of careless building or from the disintegration occasioned by vaulting thrust? By no means. Tie-rods might have been called for, at any date, from a time imme-

diately following the erection of the building down to the present year. The original divergence might have been accented and increased by thrust to a point which made the tie-rods necessary. A very few inches of accidental movement would be sufficient to make this advisable. Even if the vaulting had fallen in, it would not prove that there was not originally a constructive divergence. In fact, such a divergence, if carelessly constructed, or of too great a spread, might cause exactly such a catastrophe.

Mr. Statham's entire sentence, of which a portion has just been quoted, does him no great credit: "If he had found evidence that they were ancient it would have made short work with his theory, and he has apparently not tried to get any evidence." Mr. Statham knew, when he wrote that sentence, that I had taken pains to ascertain the opinion of the expert who had the best general knowledge of the history of the church and of its present condition. I had published this opinion in the very article which he was endeavoring to discredit by this trick of suppression. I have the highest French authority for stating that it was M. Benard who first brought to the attention of students the celebrated mediæval architectural sketch-book of Villard de Honnecourt, and that M. Benard was an expert of the most reliable character.

The same disposition to mislead his readers is apparent in Mr. Statham's suppression of the opinions of Italian experts. The one man, who by virtue of lifelong acquaintance with the history of St. Mark's at Venice, and his own literary contributions to that history, and by virtue of his own lifelong contact with the repairs of the church of which he was then in charge, was best qualified to pass an expert opinion on that church, in 1901, was Commendatore Pietro Saccardo. St. Mark's is a much more important church than that of St. Quentin. It has consequently been much more carefully measured and published by me, and has been made the subject of a special monograph. Saccardo's official approval of these observations has also been published. All this was known to Mr. Statham, and all this is carefully ignored in order to make good his own personal idea about the widening refinement.

His personal idea is that to build a church with outward bending or curving verticals is "one of the most clumsy, useless and stupid things that could possibly have been done." It would have been an awkward fact for this thesis if his readers should know that the finest church in Italy has been officially credited by the architect in charge with having this construction. Consequently that fact is carefully suppressed.

The "Builder's" argument is otherwise to the effect that "the widening of the piers at the upper portion would have the effect, not of increasing, but of diminishing the apparent height of the

building, and this at a time when the French architects were vying with each other in the endeavor to increase height. The whole notion is too preposterous to do anything but laugh at."

The "Builder" appears not to be familiar with Viollet-le-Duc's proofs, recently quoted with approval by M. Choisy, that the architects of twelfth and thirteenth century Gothic strove to keep down the height of their buildings, and that their great height is due to compelling constructive causes (contrary to the usual idea and preconceived opinion).*

I have shown the widening refinement to be originally Byzantine and Romanesque (that is to say, it was first designed for churches of comparatively low proportions), and I have shown that it disappeared during the late Gothic and soon after the really exaggerated heights came into Gothic vogue. However, a glance at Fig. 4 for the Amiens nave in the November Number of the Architectural Record seems to give the best answer to the objection of the "Builder." For the sake of the gracefully bending lines and the more open and airy effect of the upper nave, for the sake of eliminating that frightful rigidity and coldness which the taste of the "Builder" and the temperament of Mr. Statham have grown not only to tolerate but to consider as a necessary standard of perfection, the architects of Amiens may have been willing to sacrifice a little of the effect of height, and they did well, in my opinion, to do as they did.

There are, however, very few of us who estimate the height of a lofty nave by twisting the neck so that we look directly upward. In so far as the eye takes in the height of a building naturally, and without wrenching of the neck; in so far, that is, as the comparative width between the same piers at the pavement and at the capitals, is estimated at some distance from the standpoint of the observer, in so far such a perspective convergence of lines as holds for a plane surface near the level of the eye, is very materially diminished. Our impressions of height in interiors are not determined by converging lines to anything like the extent which holds of impressions of length or distance on a plane surface. The proof of this is that photographs taken with the camera slanting upward appear freakish and unnatural. This shows that we are so accustomed to discount convergence in rising lines that we do not recognize it in a photograph, although shown as we actually see it. On the other hand, convergence of lines on a plane surface, as shown by a camera, has no abnormal appearance.

Estimates of height in lofty interiors are naturally made by the eye in a normal or not too inconvenient position, looking toward

*Dictionnaire III., pp. 187, 197. Choisy, Histoire de l'Architecture, II., p. 413.

the depth of the building, and contrasting with the entire height as seen *there*, the objects near the pavement. These are again related by the eye to the average height of the human body. In estimating the height of interiors, the height of the human body is the natural norm, and the objects on the plane surface which are related to this norm, in their turn become standards of height.* The easiest position for the head of the observer is the position in which an estimate of height is most easily and most naturally made, and in this position the more distant objects on the plane surface are related to the height as visible at the same distance. Therefore, in the perpendicular direction converging lines have very little to do with our estimates of height, either in exteriors or interiors, and the builders of the Middle Age were by no means "clumsy" or "stupid" in slightly opening out their vertical lines in interiors.

It is we who are too clumsy to appreciate their delicate art, and too stupid to admit that it existed.

As the entire art of the Middle Ages was experimental, it is natural that some buildings should have more widening than others, and that some should have too much. Sta. Maria della Pieve, at Arezzo, and the church of St. Quentin may be open to this criticism, but it is the extreme cases which make the best photographic illustrations, and furnish the easiest demonstrations in so novel a topic. The truth is, that at St. Quentin the nave is seen from the entrance (and also in photographs from the entrance), through the arches of a very low vaulting, which supports the organ loft. The lines of these arches curve over against the curving piers so as very much to exaggerate their apparent leans by this optically illusive contrast. This effect was, of course, not foreseen by the mediæval architect.

Meantime, the Editor of the "Builder," having come round to the admission that perspective illusions were practised by mediæval builders, may possibly condescend to notice the fact that the only extant systematic publications on the subject are those which I have made. This fact he has carefully suppressed in his recent admission of the existence of mediæval perspective illusions, although several caustic and slighting notices appeared in the "Builder" during the publication of the series of articles in which the existence of these illusions was demonstrated in the Architectural Record. My first announcement that "perspective illusion was practised on a most extensive scale throughout Italy and the whole of Europe in the Middle Ages" was made in 1874† in the words above quoted.

The publication in which this announcement was made was the

*It is well known that St. Peter's appears larger when filled with people. It is also well known that the over-enlargement of details like the cherubs of Bernini's fonts, which are seven feet high, has diminished its effect of size.

†Scribner's Monthly, August, 1874, p. 440.

first publication ever devoted to this subject. Aside from the confusion of ideas on the physiology of vision in interiors which afflicts the Editor of the "Builder," he has failed to reflect that, as I have done more than anyone else to insist on the existence of perspective illusions in mediæval architecture, I may be safely trusted not to antagonize the results of my own observations. He wholly fails to notice that such observations have been made by me.

It farther appears that the Editor of the "Builder" has discovered "a certain condescension in foreigners" (and *this time* the foreigners are Americans) in regard to English Gothic. He suggests that I should "condescend" to study English Gothic, in order to discover further aberrations of the class which he claims are non-existent anywhere, with the illy-concealed purpose of "wiping up the floor" with me, after I have fallen into the trap which he has so discreetly baited at Salisbury. I have seen the piers at Salisbury, and, so far, have not mentioned them in any publication on constructive widening.

Mr. Arthur Hill, F. R. I. B. A., of Cork, has, however, discovered, measured, and photographed a constructive widening of the nave piers in St. John's at Chester, and it may be, at some future day, that I shall mention other English or British instances.

Wm. H. Goodyear.

(To be continued.)

INTERIOR FIREPROOFING.*

[*The following is the second of a series of Technical-Industrial Reports upon a certain System of Fireproofing, made to the Manufacturers by the well-known expert on Building Construction, Mr. William J. Fryer.*]

In determining what material shall be used in the construction of a fireproof building and in what form such material shall be used, one pre-requisite should be demanded; the material and form alike should be solid, without voids or spaces or hollows. Concealed spaces are extremely dangerous by reason of the bursting power of confined air when expanded by heat. Expanded air will run an engine, and will and has overthrown brick walls, partitions and floor constructions.

Solid Material a Necessity

A brick wall is popularly supposed to be solid, but as a matter of fact it is full of voids. In laying brick the bricklayer ordinarily depends on one trowel of mortar spread out to bed seven brick stretchers, the first brick laid to the line and so on until the seven are laid, instead of embedding brick for brick, each time going to the mortar box for a trowel of cement, thus ensuring solid work, with the bed joint, cross joint, and cellar joint filled solid with mortar. "Tip" joints, which are merely the vertical joints blinded with mortar, so as not to show to the eye, and with heading courses laid where the joints should be solid throughout, voids are left everywhere, and indeed it may truthfully be said that more or less unfilled joints are around every brick in a wall as commonly laid, all by reason of the desire to save in the expense for labor and mortar. Only when all brick are rubbed up and all joints filled by one operation, or each course is grouted in, can a wall be called solid. A brick wall, a brick partition and a brick segmental arch between steel floor beams, prop-

Voids or Spaces in Brick Walls

*For previous article see November Number.

erly laid up in good cement mortar, is the standard by which all other material and combinations of material and forms into which such materials may be worked, are to be judged.

Concrete, unless made with Portland cement, clean, sharp sand and clean broken stone or gravel in their proper proportions—not using ashes, cinders, clinkers or any other partially carbonized material—in the mixture, and the concrete well tamped in laying, deserves small confidence. Instead of gravel or small broken stone, cinders are used in order to keep the mixture from weighing too much, as lightness is an important consideration for floors and partitions. A mixture such as is commonly provided, the ingredients, such as they are, improperly mixed by unskilled labor, and hurriedly laid in place, will be found full of voids and incapable of resisting fire and water or both combined. In the progress of fireproofing during the past twenty years, the common brick arch between floor beams has given way to systems that form a level ceiling in themselves and weigh less than solid brick. Certain materials and forms have been used and passed almost out of memory. One of these was the Lime of Tiel and ashes, moulded into hollow blocks; and the architects and others who were responsible for such use have, to use a slang phrase, tried to forget it. A fire occurred on the upper floor of a building in which these plaster floor blocks were installed, and the water used in putting out the fire carried havoc and destruction through every lower floor to the cellar. The so-called flat-arch system of burnt clay hollow blocks has become the most extensively used. In reality the blocks do not form a flat arch at all; the blocks have slanting sides, but not the true radiating lines of a flat arch, and the cohesiveness of the cement mortar joints is depended upon to prevent the blocks sliding upon each other. In a true flat arch no two radiating lines are alike between the key-stone and the abutment. With the material—burnt clay—no exception can be taken. The thickness of the material, particularly that of the bottom plate of the hard burned tile is insufficient to resist any considerable heat, the under portion of the tile being exposed to more heat than the rest of the material and breaks by unequal expansion. The blocks or tiles are hollow, each divided into a number of small compartments or cells running their full length. Here is where the danger lies: the air thus confined when expanded by heat in case of fire.

Concrete of Improper Mixtures

Abandoned and Defective Systems

Quite recently, in the latter part of September last, an important test of a hollow tile arch was made in the vicinity of New York, and although the test was an utter failure of the arch, the result is likely to be far-reaching and of greater consequence than any test of floorings made in many years past. This arch was constructed by the manufacturer and representative engineer with the main object of proving that the National Board of Fire Underwriters was wrong in refusing to sanction a twenty-foot span arch, constructed as this was, for one of the largest warehouse buildings now being erected. This arch was constructed to cover a bay twenty feet square, in the form of a groined arch, the rise in the center being fifteen inches. The tiles were six inches in depth, filled on top with concrete, the concrete being three inches in thickness at the crown of the arch, eighteen inches in thickness at the haunches, and over the concrete the finished cement flooring. Presumably this arch was carefully put together for testing purposes and therefore constructed better than the same arch would have been in actual practice where no special precautions are taken and where the work is hurriedly done. A uniformly distributed and comparatively light load of 250 pounds on each superficial foot had been placed on the floor surface above the arch, and with this load the arch should have stood a better test from fire underneath than if no load had been placed thereon, as the superimposed load kept the construction below evenly compressed. The load was intended to be further increased to fifteen hundred pounds per superficial foot. The abutments for the arch were adequate and remained intact, as did the wall which supported the arch. Full preparations had been made for taking temperature, and also for noting any deflection that might occur in the arch. The fire was started at 11:50 A. M. At 12:07 P. M. the arch collapsed completely; that is, in seventeen minutes time. The temperature at the time of the collapse was about 1,700° F. The quick and complete failure of the arch dumbfounded every one present, even those who came with well-founded dislike of wide span arches between floor beams, and opposed to such unless reinforced by steel beams. Remembereing that the supporting walls and the abutments were not affected, what caused the collapse? It certainly was not the load, because the arch was sustaining the load before the fire test was applied. The heat did something—What did it do? It expanded the air in the cells of the tile and thereby inevitably brought sure and sudden destruction. This force must be reckoned with in the future.

A Test of Hollow Tile Arches

Thus these various systems of fireproofing are encompassed with elements of doubt and uncertainty for their users as to which one is the superior or if any merit full reliance. In every line of work progress has been and is constant and unceasing. In fireproofing there is a system, not so generally known as many others, being newer, but which is superior to any other when judged by all known requirements of lightness, solidity, strength, fire resisting, durability, practicability, proven by tests and actual use.

A Superior System of Fireproofing

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