

THROUGH THE AGES

AUGUST, 1924

"If breadth is to be beautiful, its
substance must be beautiful."

—*Lamp of Power*: RUSKIN



THROUGH THE AGES



VOL. 2

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NO. 4

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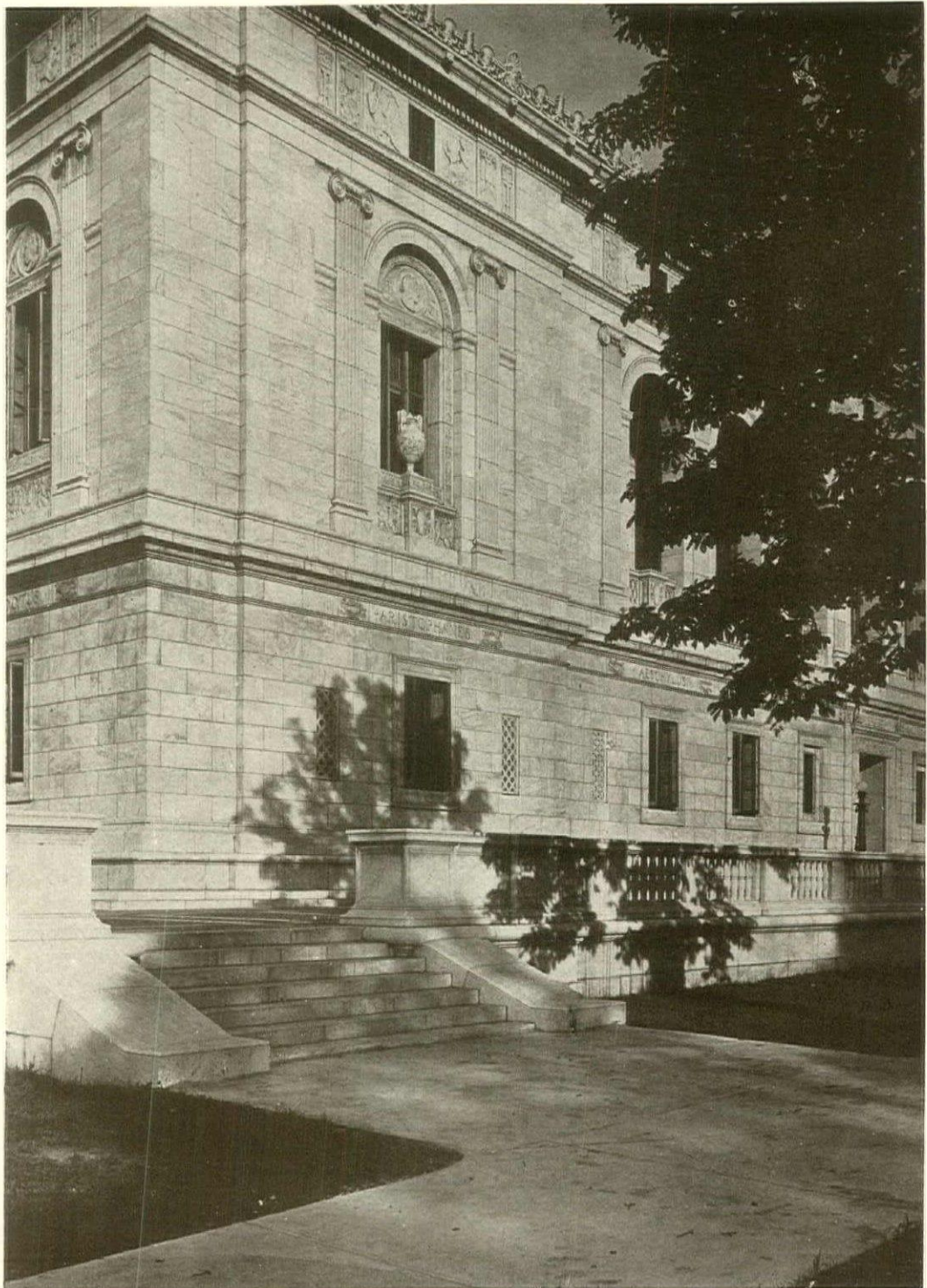


Illustration courtesy *Art and Archaeology*.

The Detroit Public Library, designed by Cass Gilbert, of New York.
"It is perfect rhythm immobilized, a song in marble, the grace
of movement without movement. You cannot get away
from the idea of music and poetry as you gaze
at this architectural symphony."

THROUGH THE AGES

A Monthly Magazine devoted to
the uses of Marble - its universal
adaptability, beauty, permanency
and economy.

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THE DETROIT LIBRARY

An Evidence in Marble of the Growth of Civic Consciousness

DETROIT, that city of youth and bigness, of motor cars and intense commercialism, has begun to appreciate the value of the Fine Arts. Like many other middle west American cities, Detroit has been so affected by the march of the country westward that it has had little time for anything but growth. Beginning as a blockhouse, it has increased in size and population until it is now spread over a territory of many square miles and contains more than a million people. A large part of this growth has been within the last fifteen years.

There have, of course, been erected in the city some worthy structures during this time, including a few Gothic and Romanesque churches; some adaptations of these styles, as well as the Italian Renaissance, to commercial structures; and the usual array of office buildings, hotels and the like in combinations of these styles. Of the more modern buildings of excellence, the Public Library, by Cass Gilbert, is worthy of more than passing notice. The erection of any great municipal building is an enormously difficult and complicated problem and this latest structure is ample evidence that De-

troit is growing to appreciate good art and good architecture.

The Detroit Library was originally opened on March 25, 1865, with a book collection of 5,000 volumes. The location was moved twice in the seventies and in 1875 the corner stone of the first library building was laid. For nearly fifty years, the building in the heart of the downtown section was occupied as the Main Library. On March 21, 1921, the new building uptown was opened to the public.

The total cost of the new Public Library was \$2,775,000.00, of which sum \$375,000.00 was contributed by Andrew Carnegie. The site on Woodward Avenue, a main thoroughfare, is practically a square block with a frontage of 529 feet and the cost was \$416,000.00. It is one and a half miles from the business district and opposite to it is the new Institute of Arts, now under construction. This latter building is the work of Paul P. Cret, Zantzinger, Borie and Medary, of Philadelphia, and the two buildings together form the nucleus of a Fine Arts Center that promises to be a rendezvous of beauty and culture, the center of Art and Letters for Detroit.

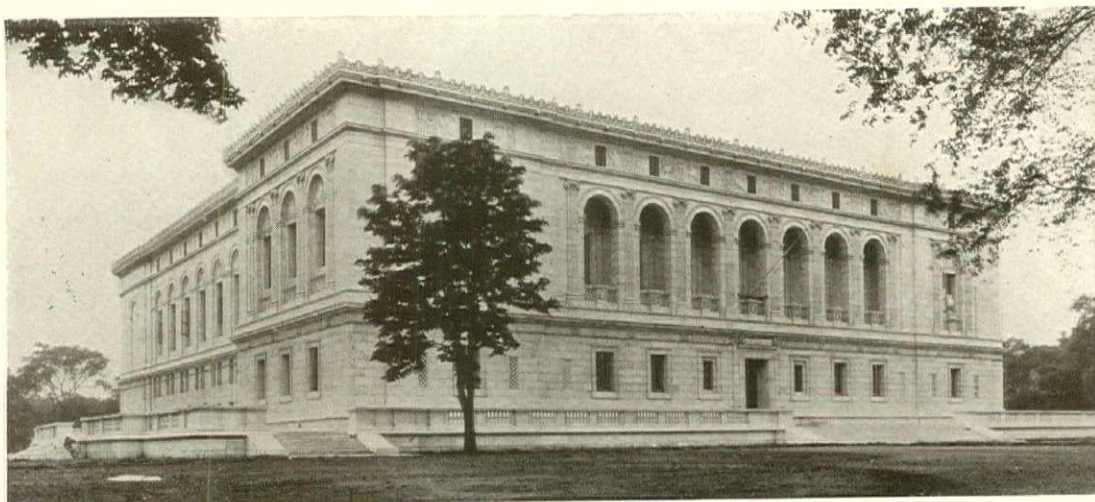


Illustration courtesy *Art and Archaeology*.

The style is early Italian Renaissance at its best, the Golden Age of the Revival.

The location of the building is happily chosen, since there is ample space for creating a terrace treatment and a sufficient setback of the structure from the main street to insure the proper ensemble view. The building itself is very impressive. The shape is almost square (it is 219 feet long by 196 feet wide), and the 60-foot high mass of white Vermont marble has a roof finished with an ornamental terra cotta cheval de frise of white and gold. The Library is surrounded by a broad balustrade, also of white marble, a finishing detail to an exterior of great beauty. Landscape gardening between this and the new Arts Museum will be a relieving feature among the activities of the busy thoroughfare.

In an article recently published in *Art and Archaeology* Mr. W. Francklyn Paris says of the building:

"The style is early Italian Renaissance of the period of Sangallo and Peruzzi, of Brunelleschi and Sansovino, when sentiment was not considered a weakness and skill of execution went hand in hand with elevation of thought.

"When Mr. Gilbert was invited to submit a design for the Detroit Library he readily

solved the problem of horizontal divisions, distribution of masses and the relativity and proportions of the various floors and rooms, but his inward eye viewed the façade vaguely and he set off for Italy to revive his memories of the Villa Papa Julio, the Villa Madama, the Farnesino Palace, the Loggia of Raffaele, the Cancelleria and the other flowers of architecture of that golden era scattered over the peninsula from Florence to Rome and from Venice to Siena.

"The characteristic of right performance is a certain spontaneity, an unconsciousness. Having the eye to see, the heart to feel, the artist must yet have the hand to draw and the voice to sing. Mr. Gilbert is well endowed with both hands and voice and his work is never lacking in personality. Of no living architect can it be said more truly that he creates and does not merely manufacture. He is big enough, however, to acknowledge his indebtedness to the torch bearers of the past and to sit at the feet of Raffaele Sanzio and Michelangelo Buonarroti.

"To say therefore that the Detroit Public Library, without being in the least fashioned after the Vatican, or the Villa Chigi, or San

Lorenzo, yet gives forth the same perfume as these wonderful flowers of the Italian Renaissance is not to take away the least particle of Mr. Gilbert's credit.

"Like Rude's statue of Marshall Ney, it is arrested motion, if the metaphor may be used in connection with a building. It is perfect rhythm immobilized, a song in marble, the grace of movement without movement. You cannot get away from the idea of music and poetry as you gaze at this architectural symphony."

The façade contains open loggia at the first floor level, formed of arched openings. This façade would seemingly indicate three floors; in reality it is a four-story structure, if we consider, as we should, the mezzanine as a separate level. The ceiling of the first floor has a height of 25 feet. This height is needed as a foundation for the arch treatment that has been given three of the four sides. These arches are arranged seven to a side, in close formation, with two more detached and placed one on either side of the seven open bays.

Rising to the full height of the first floor are Ionic pilasters on each side of the arches, nobly designed and strikingly accentuating the graceful curves of these openings. The most distinctive architectural feature of the façade is, indeed, the monumental loggia formed by these central arches, a feature comparable to the best work of any period.

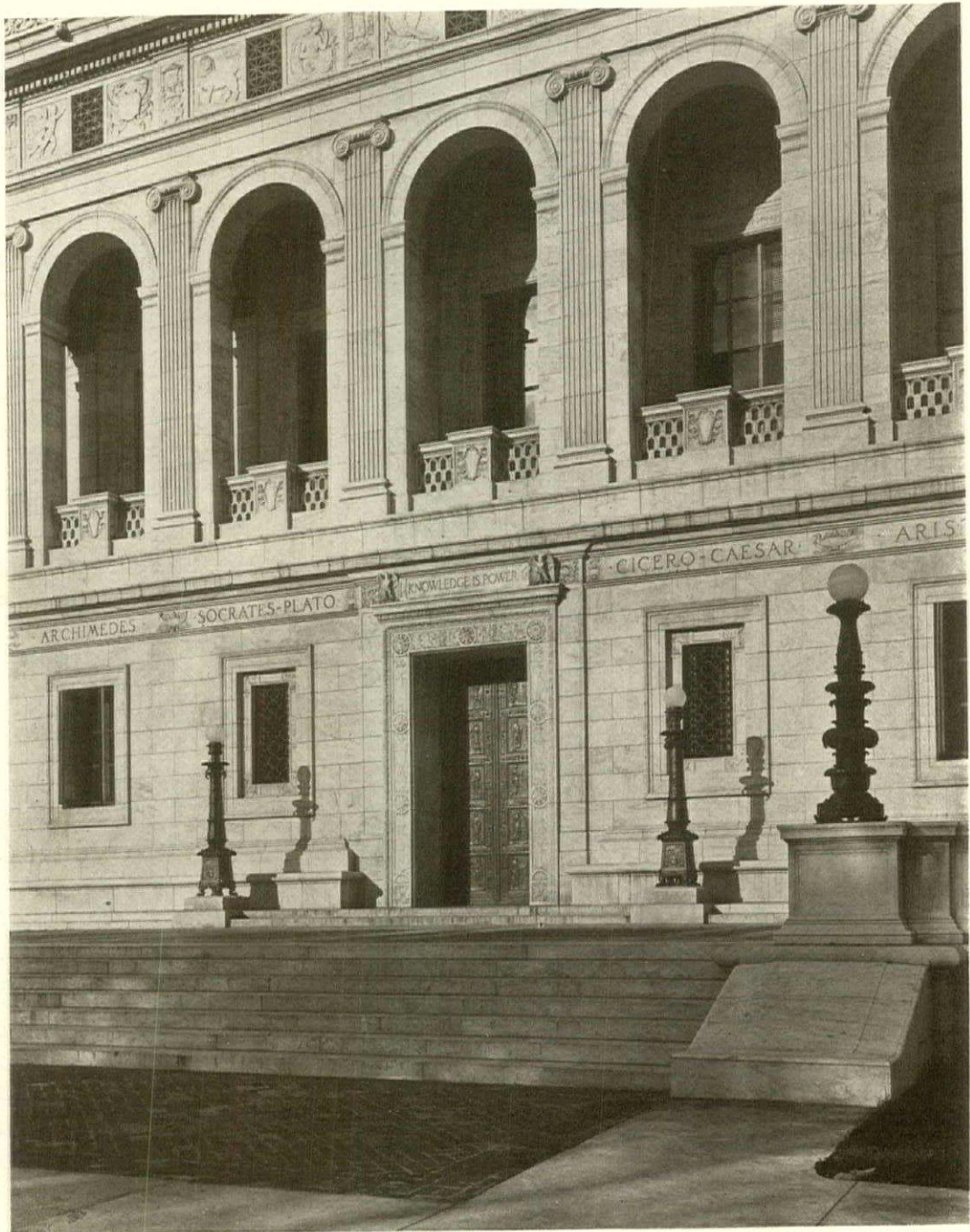
The ceiling of this loggia has groined vaults set with mosaics by Frederick J. Wiley and executed by Mary Chase Stratton. Here is the only color on the outside of the building, except for the gold of the cornice. The theme for this ceiling decoration was taken from Shakespeare's *Seven Ages of Man* and the composition is extremely sensitive, the thousands of many colored tesserae forming a series of garlands and

medallions that seem more like brushwork than mosaics.

Beneath each arch and serving to balance them, are eight rectangular windows in the lower horizontal division of the façade, which is in reality the base of the whole design. In addition to these openings, there are six smaller openings, three on each end portion of the base, symmetrically disposed and opening into smaller rooms that require but a moderate amount of light. Speaking of this problem of fenestration and the care shown by the architect in working out certain other details, Mr. Paris says:

"Mr. Gilbert here was confronted with a choice of difficulties. It is not easy to distribute along the same level and at irregular intervals eight large windows, almost square, and six small ones that are narrow and long. At first blush it would seem as if all feeling of symmetry must vanish under such an arrangement. The architect has solved the problem by giving a deep recess to the large openings and almost no recess at all to the smaller windows, so that the larger wall openings alone stand out as architectural and structural features, while the smaller windows assume a neutral character and appear as applied ornament. The wall, thanks to this treatment, appears to be pierced in only eight places instead of fourteen.

"The care exercised in preserving the effect of strength is apparent in other parts of the façade. This shows a deep study of the third dimension, a grappling with the problems of proportions not only in height and width, but also in the depth back from the surface. The thickness of the walls, while not excessive, is adequate to convey the idea of stolidity and permanence. The cornice, the depth of the loggia, every exterior detail gives evidence of having been carefully considered as far as recessing and projecting are concerned. The result is a



Detail of Entrance, showing Loggia above.

monument that is graceful without being frail and beautiful without being effeminate or decadent.

"Mr. Gilbert's concern for proportion is shown also in his treatment of the topmost

story, which he has used as an intervening frieze between the delicate pilastering of the second story and the splendid cornice which dominates the entire structure.

"This upper story is pierced with nine



Illustration courtesy *Art and Archaeology*.

The Entrance Hall, showing the columns of pink marble. The ceiling decoration is by W. F. Paris and F. J. Wiley, of New York. The walls and floor of this hall are also of marble, all of it domestic.

wall openings to correspond with the nine arches of the lower floor, and is richly adorned with twelve sculptural panels in vertical alignment with the twelve pilasters of the main story. These panels are in low relief and portray the signs of the zodiac and their equivalents in ancient mythology. Although distant from the eye some 50 feet or more, this decoration is remarkable for its detail and for the ornamental values obtained. It sets off the cornice without detracting from its importance in much the same manner as the balustraded terrace sets off the base of the edifice for which it serves as a plinth.

"The cornice itself shows great intellectual command of form and is a masterly combination of simplicity and homogeneity of plan with elegance and variety of detail. In it are harmony and light, serenity and grace, joy and beauty. Its perfect balance with the rest of the structure, the impeccability of its proportions reveal the architect's complex talent, made of nature and art, of culture and instinct, of spontaneity and reflection.

"The world is full of noble edifices whose perfection has been marred by too scant or too massive a crown. It is here that an error in proportion shocks the eye with the greatest violence. Sometimes a few inches in height or projection are enough to destroy the balance of the whole structure.

"The Library of San Marco in Venice, to cite but one instance, fails to suggest the idea of unity of structure because of the balustrade and statues which crown the edifice and which are in balance with the story immediately below, but out of scale with the composition as a whole. The effect is produced of one structure superimposed upon another. A cornice which is well proportioned to the arcade or colonnade below must be on a scale related to the colonnade. On the other hand, after all is said and done,

the cornice is the cornice of the entire building, and that which is adequate for the colonnade of a single story, is inadequate for the entire building, if for no other reason than that it is placed at a greater height.

"Sansovino's Library frankly accepts the proposition that it consists of two superimposed 'orders' or arcades embellished with attached columns of practically equal importance. In its way it is one of the world's most beautiful buildings, but the cornice is a discordant note in an otherwise perfect melody.

"In the Detroit Library we have a very simple vertical composition consisting of a broad base constituting the first story and a single 'order' of pilasters and arches forming the second story. A cornice which would have been acceptable for the 'order' of the second story only, would not have been adequate for the full height of the building, and for this reason, the 'order' of the second story is very skillfully subordinated to a broad frieze and cornice which dominate the whole structure. In other words, you are made to feel that the cornice is the cornice of the whole edifice and not the cornice of only a part of the structure.

"The fact that it does not overweight the refined architecture of the second story is due to the interposition of the frieze. Imposed directly upon the pilasters and arches of the second story it would have crushed them and have killed the rhythm and repose of the entire composition.

"The cornice is crowned with a cheneau executed in terra cotta of old ivory tone backed with gold. There is just enough contrast with the marble of the rest of the building to accentuate the richness of the design and to illuminate the crest of the monument as it outlines itself against the blue or gray of the sky above.

"This touch of gold in the cornice and the



Illustration courtesy Art and Archaeology.

The Main Stairway, leading from the Entrance Hall to the Delivery Room, is built entirely of marble. The treads, risers, balusters and walls are all of this material. It has a barrel-vaulted ceiling, with noteworthy decorations by W. F. Paris and F. J. Wiley.

gay mosaic in the loggia, combine with the texture of the white marble to give to the exterior of the building a chromatic touch that adds not a little to the visual delight caused by the perfect equilibrium of form and the classic simplicity of line evidenced in every part of this modern temple to Minerva.

"Done in granite, or in any other stone than marble, it would have looked severe and cold. As it is, it has a 'complexion' that blushes with the setting sun and glows under the light of midday. Every changing light brings with it a new tint, gray when the day is gray, golden when the day is bright. In the evening, you will find soft violet shadows, in the morning delicate pink will cover the surface. You feel the penetration of light into the surface of marble as in no other material. Every angle, every moulding, not only reflects the sun but absorbs it, thus softening the glare and deepening the shadows.

"The applied decoration is laid on sparingly, but wherever used, the contours have been very fully developed so that no matter how low the relief, the outline is very distinct and the feeling of depth very strong. This is particularly true of the carving in the loggia which is of the purest late fifteenth and early sixteenth style and adorns the windows and tympanum under them with a wealth of delicate *découpure* such as Donatello or Ghiberti might have chiseled.

"Wherever marble or bronze carry relief ornamentation, the eye is charmed with the purity of the design and the definiteness of line, the sharp and yet soft quality of every contour. It is no secret that Mr. Gilbert and his talented pupil and associate, John R. Rockart, spent happy hours together composing this applied decoration and reviewing and amending the designs that were to be finally modeled by master hands.

"Originally it had been intended to center seven sculptured figures, one under each arch of the frontal colonnade, but it was decided that the simple openings were better unencumbered with statues. The value of the shadow cast by the unobstructed opening is much greater than the irregular broken shadow, partly on sculpture and partly retreating would have been. The statues would have confused the façade and might also have impaired the natural lighting of the interior."

The entrance to the building is through bronze doors into an entrance hall flanked on each side by a row of Roman Doric columns of Tennessee marble. These bronze doors are especially noteworthy. They are set into white Vermont marble, delicately carved from models from the same sculptor who did the carving on the doors themselves, and the same hand was responsible for the carved heads in the rondels of the arched opening of the first floor. The doors are decorated in very low relief, the motif being from a scheme by Donatello. The subjects shown in the ten panels are Roman and Greek events relating to Poetry, Philosophy and Comedy. The outlines of the designs are unusually sharp and clear, and are ornamental even from a distance. Within, the Library is planned in accordance with modern ideas regarding the functions of such an institution. Instead of the main chamber of the Library, the delivery hall, being somewhere near the top of the building, as is too often the case with many similar structures, it is here placed on the first floor. It is surrounded by the reference room, entered through a hallway containing the public catalogue; the civics room; the fine arts room across the front, from which entrance is afforded to the loggia with its mosaic ceiling; music and drama rooms; and open shelf rooms. Besides there are special

rooms for teachers, conversation, correspondence and for the staff secretary. The drama room has a fine memorial alcove for a special collection of letters and books pertaining to the drama and famous actors. The entrance way does not lead directly into this delivery hall, however, but into an entrance hall as mentioned above. The ceiling is richly coffered in the style of the sixteenth century, with caissons and rosettes in high relief, touched with gold and soft colors that impart a note of cheerfulness to the otherwise sombre, dignified room. The pink-gray of the marble suggests a quiet restfulness hardly possible with any other material and forms a fitting introduction to the beautiful interior.

From the entrance hall, leading upward to the large delivery room, is a grand stairway of marble, tripartite in form with a barrel-vaulted ceiling, extending the full length of the building. The walls of this are of Tennessee marble "with a depth of tone as mellow as old ivory." The ceiling itself, rich in color, has been treated in the style of the Italian Renaissance, with octagons, squares and circles surrounding ornamental figures and arabesque designs modeled in low relief, and brought into unity by the intervening canvases. These, by Blashfield, assisted by Vincent Aderente, have been placed in two spacious lunettes over the delivery room door, flanked by two heroic vertical panels.

The delivery hall occupies the center of the first floor. This room measures about 75 feet square, with a ceiling 36 feet high. The floor is of Tennessee, and the walls of Indiana limestone. All four walls have a series of arches edged with bronze trim in low relief carving, besides having grilles where the arches become doorways. The ceiling is of handsome design, in blue and green, and a frieze of mottoes, gold on

dark blue, runs around the four sides. In moulded rondels are shields, placed between the arches, and murals by Gari Melchers, while stained glass windows add to the beauty of this splendid compartment.

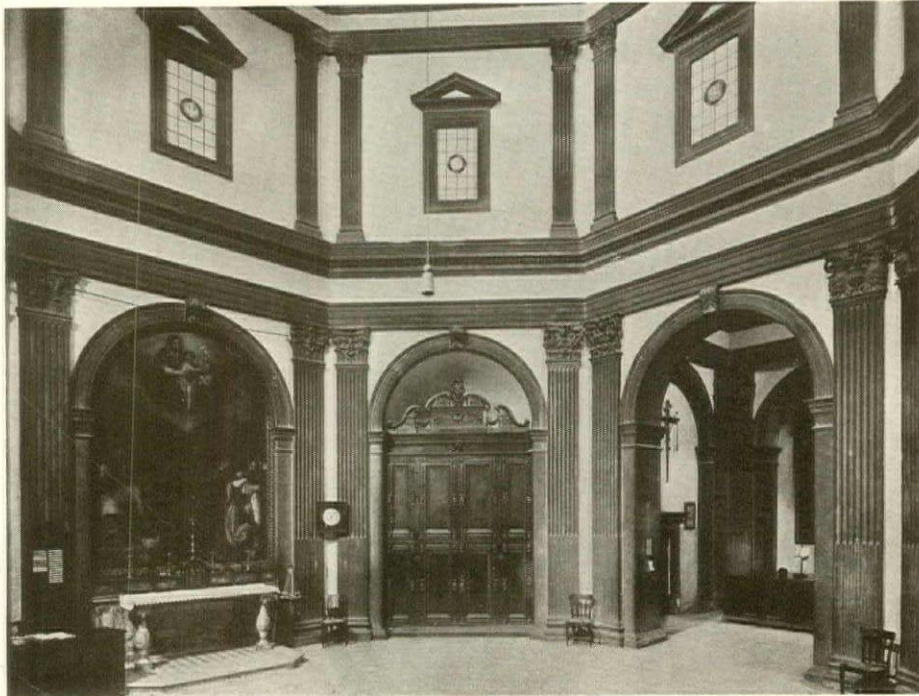
On the second floor are, on the one side, rooms, for the technology department; on the other, rooms for the Burton Historical Collection and Assembly staff. There is also a dining-room and a rest room for the staff, besides a club room and photostat room.

On the ground floor at the right of the main entrance is the children's room, which has a separate entrance from Kirby Street. Here is a fireplace of Pewabic pottery depicting scenes from famous juvenile books and tales. Such characters as Alice in Wonderland, Crusoe, the Tar Baby and Mowgli are shown in attractive fashion.

At the left of the entrance, is the periodical and newspaper room. This floor contains also the branch and sub-branch departments, the bindery, the schools division, the lockers and the rooms for packing and shipping. The offices of the Librarian and the Library Commission are on the mezzanine floor, as are also the book order and catalogue departments, and lavatories.

The stockroom runs the full width and height of the building and contains space for 650,000 volumes. There are seven tiers of metal stack with floors of white glass, each tier connected by stairs and electric lifts, to provide ready accessibility and the convenient transfer of books.

A driveway runs through the building, facilitating the delivery of books and supplies to and from the branch libraries. The elevator in the stock room is near to the door of the shipping room. It is such planning as this, carried throughout the entire structure, that makes the Detroit Library a notable achievement, even if we leave out of consideration its architectural splendors.



Interior of Octagonal Sacristy, Church of S. Spirito at Florence.
The architects were San Gallo and Cronaca.

EARLY RENAISSANCE IN ITALY

Its Development in Florence and the Milan District
of Northern Italy

WE have seen how the abandonment of Gothic architecture in Italy and the substitution in its place of forms derived from classic models were the result of a great intellectual upheaval that began in Florence, spread through Italy and thence over the whole of Western Europe. "The new movement achieved its first architectural triumph in the dome of the Cathedral of Florence (1420-64); and it was Florentine—or at least Tuscan—artists who planted in other centers the seeds of the new art that were to spring up in the local and provincial schools of Siena, Milan, Pavia, Bologna and Venice, of Brescia, Luccia, Perugia and Rimini, and many other North Italian

cities." (Hamlin: A History of Architecture.) The influence of the movement was felt later in Rome and Naples.

It is customary to divide the classic styles that grew up out of the Renaissance into four periods, not at all definite in their date-limits, and merging one into the other. Of these, the Formative Period is most usually given the name Renaissance, and this is etymologically correct, but the other periods were simply degrees of the same movement and are equally entitled to the nomenclature.

The Formative Period began, as we have seen, about 1420 and lasted until about 1490. It was characterized by its freedom

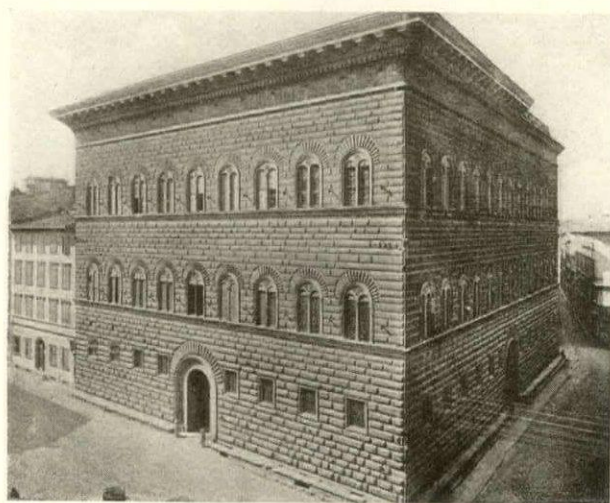
Illustrations through courtesy Thomas Machen, Architect, Baltimore, Maryland

and originality in applying the forms of the Roman orders to compositions of great variety.

The following period was marked by increasing dignity but a loss in freedom and delicacy of design. Classic details were

with new combinations of the elements then popularly used.

The octagonal Sacristy of the Church of Santo Spirito at Florence, by Giuliano da San Gallo and Cronaca, was erected between the years 1489-96. It is a work of simple gracefulness, somewhat stately and altogether reserved. There is introduced a rythmical grouping, by alternating niches with shallow recesses. The anteroom to this sacristy is a remarkable corridor 42 feet long and 19 feet wide with a beautiful wagon-vaulted ceiling all of blue marble divided into compartments richly carved, and springing from an entablature carried by six Corinthian columns on each side detached from the wall. This purely antique treatment comes close to the second period of Florentine work. The capitals, from the design of Andrea da Monte Sansovino, with their slender, digital-shaped leaves, are more nearly like the Greek and Roman prototypes than had yet been reached. Giuliano had previously, in 1485, built the first of the monumental country villas, the Villa Poggio

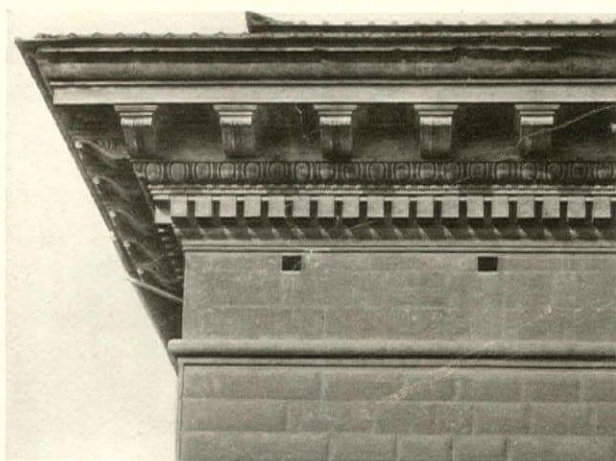


Exterior of Strozzi Palace, Florence.

copied even more closely and this Formally Classic or High Renaissance Period lasted until about 1560.

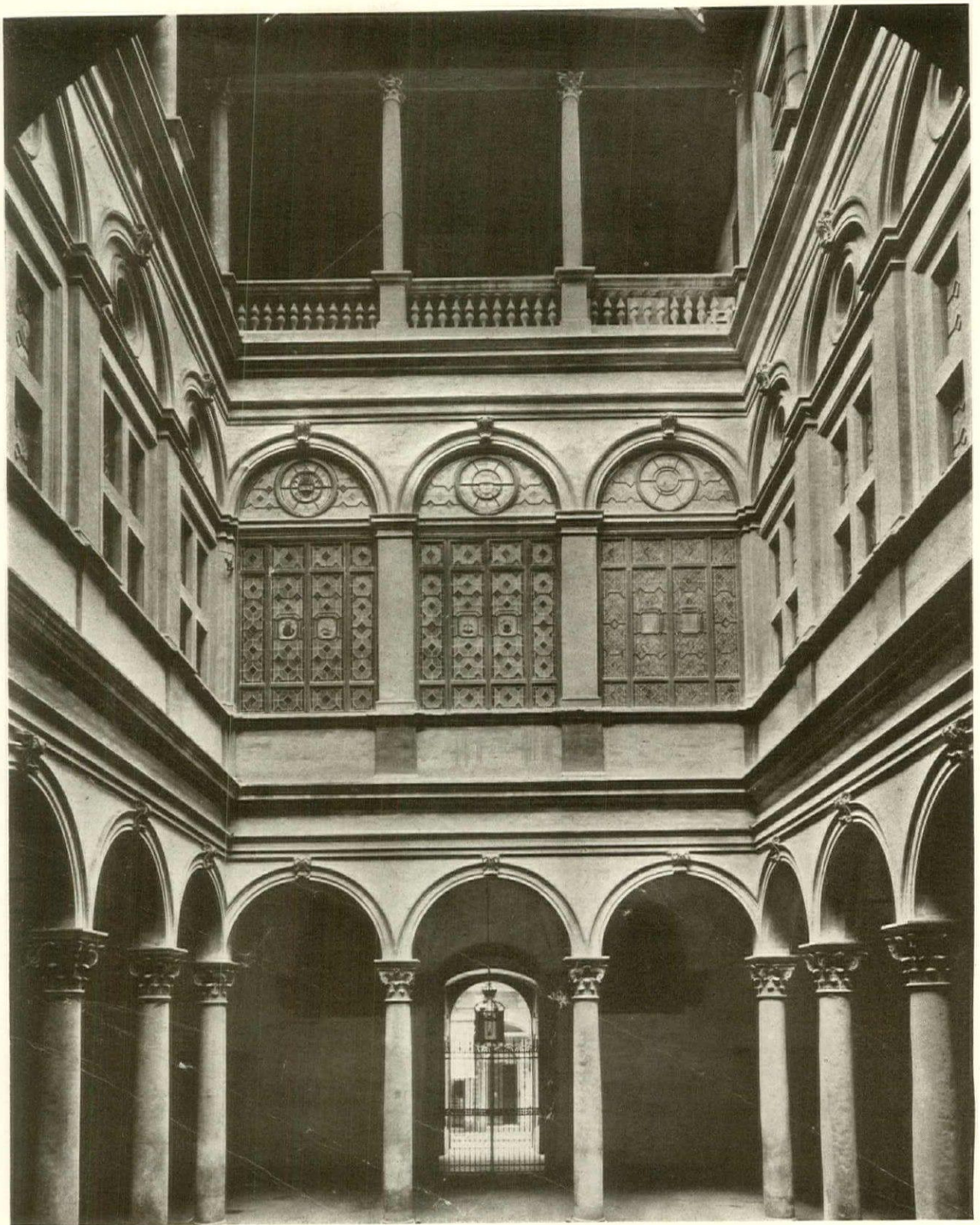
Then we come to the Baroque or Deline, during which time there was apparent an increasing poverty of originality. Colossal Orders, engaged columns, scanty and heavy decoration marked this period, until, about 1700, a reaction from these vulgar extravagances set in, and the Classic Revival showed itself in a return to the imitation of Classic Models accompanied mostly by a restraint in decoration and studiously correct designing.

Following Brunelleschi and Alberti in Florence came such men as Simone del Pollaiuolo, called Cronaca, Giuliano da San Gallo and his brother Antonio, and others who created many buildings in the style of the new classical, but who are not distinguished by any contributions containing new features. Rather were they concerned

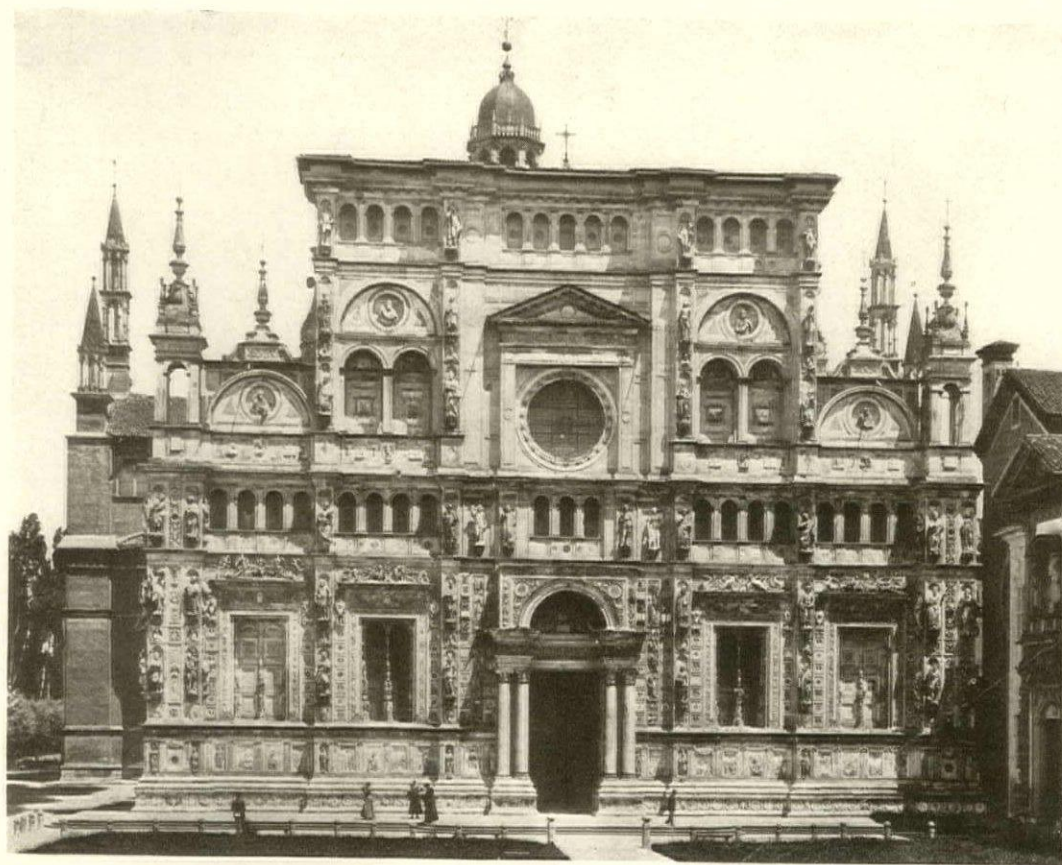


Detail of cornice, Strozzi Palace.

at Cajano. In this structure he had employed what was then a novel feature in domestic architecture. The great hall had a barrel-vault, which was entered by a por-



The inner court of the Strozzi Palace. Begun by Benedetto da Majano about 1489 and completed by Cronaca. It is looked upon as the most complete example of Florentine palazzi.



A gorgeous marble screen of Early Renaissance is the façade of the Certosa of Pavia, by Ambrogio da Fossana, known also as Borgognone, 1369-1473.

tico in imitation of a classic temple front, though this pedimented entrance way did not project beyond the wall plane.

The Monastery Church of San Salvator (or San Francesco) del Monte in Florence, by Cronaca (1487), is one of the few buildings of the Italian Revival which can be said to possess a "naïve simplicity and unaffected grace, without adornment." Michelangelo styled it his "fair country maiden," struck no doubt by its contrast with the richer and more famous Latin Romanesque San Miniato. There is much that is pleasing in the arrangement of the proportions of the whole, while the interior is grandly impressive, though not remarkable for refinement. The tendency toward rythmical grouping is shown again in the clerestory windows, en-

framed by alternating triangular and segmental pediments.

If we view the early Florentine manner as a whole, we readily perceive how at first it was affected by the preceding Romanesque and Gothic work. It was not possible for them to bridge the gap between the styles at one jump. They, no doubt, despised the methods of their immediate predecessors, but even the mediaeval church arrangements were preserved, and the heavy projecting cornice that crowned the pallazzo was due as much to the Italian Gothic as to the antique revival. The façades of these palaces showed the round arches with the extrados of the voussoirs taking a pointed form, a peculiarity of the Gothic and the mediaeval manner of placing an arch over

a lintel instead of the reverse Roman method.

"The Composite arcade of these Florentine architects, where it does exist, is composed of a high pilaster and subsidiary columns to carry the entablature, backed by an arcade formed in a wall which does the constructive work, as at the Colosseum and Roman work generally." (Anderson: *The Architecture of the Renaissance in Italy*.) We see an adherence to the Romanesque system, with practically no projection of the entablature where it crosses a row of arches, beyond that of a flat pilaster.

The Florentine churches of this period, on the contrary, are revivals of Roman forms, and present generally very weakly composed exteriors and graceful but light interiors. There is a lack of what might be called "weight" or stability in these latter, despite the demonstration by Alberti in

Sant' Andrea at Mantua of how this quality might be secured.

There was no attempt to obtain picturesque effects in the plans of these Florentine palaces, no uncontrollable desire for little irregularities, projections and breaks. The architect, when they were forced upon him, as sometimes did occur, handled them as if they were defects to be concealed as much as possible. He strove for symmetry and dignity, and most often achieved them. In spite of the fortress-like character that the palaces present to our modern eyes, with their rusticated masonry and widely spaced mullioned windows, "they marked a revolution in style and established a type frequently imitated in later years." (Hamlin.)

The courtyards of these palaces presented decided contrasts to their stern exteriors. Usually the walls of these courtyards were carried on round arches borne by columns



The Courtyard of the Palace Bevilacqua at Bologna. There is scarcely a finer cortile in all Italy, in spite of a slight tameness of design.

having Corinthian capitals. In the gallery arcade on the first floor, sometimes piers were substituted, as by Cronaca in the Strozzi Palace. From the ground floor two great staircases led to the upper floors, landing opposite the wide ends of the upper galleries. Nothing could be simpler and yet nothing could be more dignified. "Even the smallest palaces, with a few exceptions," says Simpson, "have a courtyard. That of the Strozzi is only about 22 feet square, and yet possesses considerable dignity. The Palazzo Pandolfini differs somewhat in plan from the usual arrangement, and has no central courtyard. On the other hand, it possesses a garden. . . . In the Palazzo Gondi Guiliano da San Gallo departed from the typical Florentine plan in placing his principal staircase along one side of the court, instead of at right angles to it. Its balustrade is consequently visible from the court, and makes a very effective picture, one that reflects great credit on the architect."

Vasari tells us some interesting facts about the architects' methods of presenting and preparing plans. Models were frequently used, sometimes made of wood, sometimes of metal, and sometime, as in the case of Brunelleschi and the dome of the Cathedral at Florence, of brick and mortar. The two elder San Galli were famous for their models. These miniatures were often greatly admired, and were frequently given away as gifts of great value. A model of a palace was sent to the King of France, so high was it held in esteem. The San Galli made them personally, and frequently a long time, even extending into years, was spent in their construction.

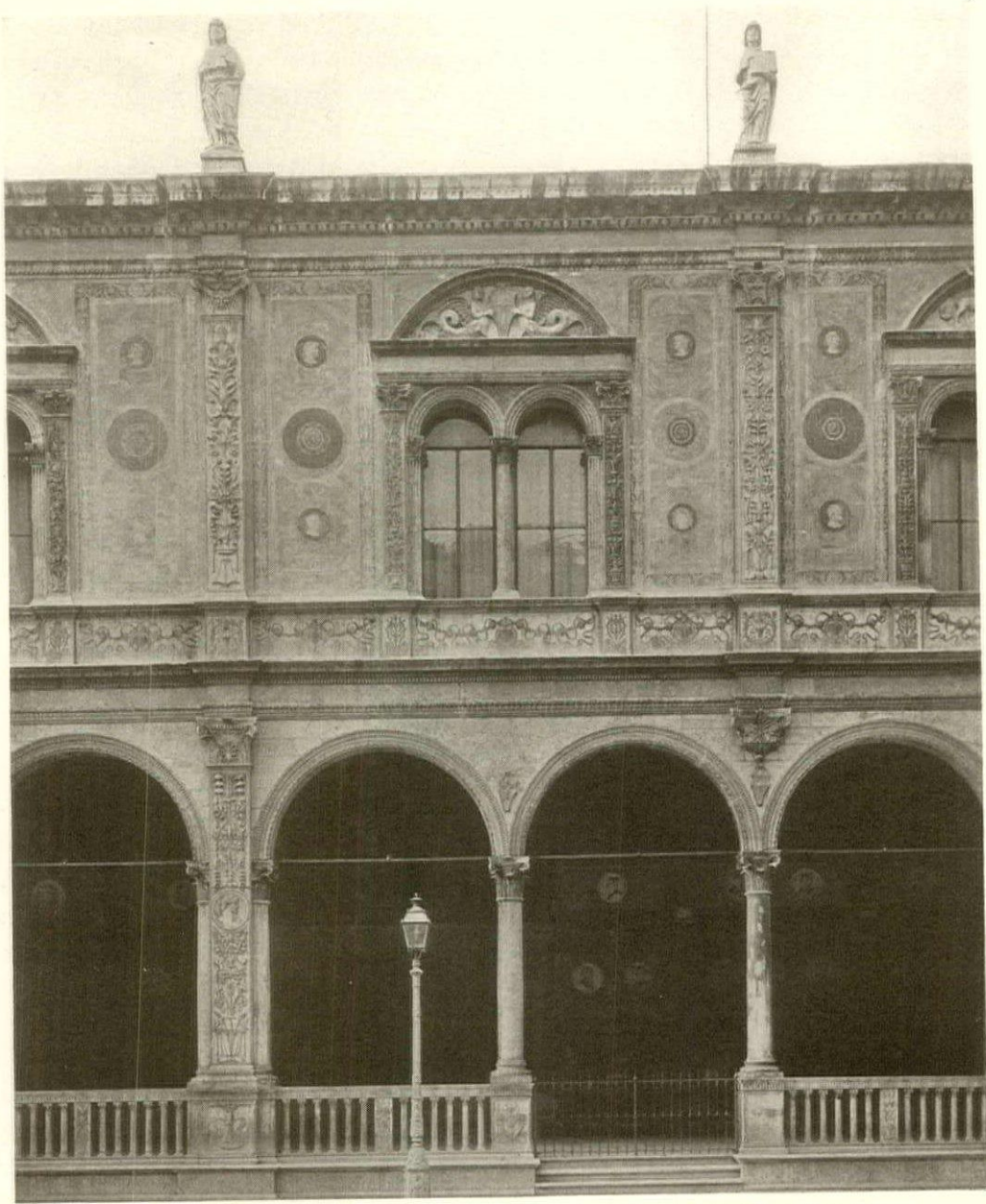
Outside of Florence and its territorial influence, Milan and its neighborhood was the first to give evidence of the new style. About the middle of the fifteenth century Florentine artists were employed on various build-

ings in the district of Milan. Filarete in 1457 built the Great Hospital, semi-Gothic in style; Michelozzi in 1462 at San Eustorgio superintended the construction of the Cappella Portinari; Borgognoni, Amadeo and others were connected with the façade of the Certosa di Pavia, begun in 1491; and Bramante is supposed to have designed the south doorway of the Como Cathedral, that beautiful white marble structure in the transitional style.

The Certosa façade presents several features worthy of notice. The deep buttresses, the Gothic basement mouldings and the niches contrast with the more classical elements, the rectangular window openings with broad architraves, divided by an inner order of baluster or candelabrum shafts of splendid workmanship. These candelabra are connected with minor arches and the whole window covered with a bold cornice surmounted by a pediment.

Bramante, who was born in 1444, settled in Milan about 1472 and remained there until after the death of his patron Lodovico, Duke of Milan, in 1499, when he moved to Rome.

Most of his buildings in the North show evidence of his training as a painter. The candelabrum pilasters on the outside of S. Marie delle Grazie in Milan are painted decorations rendered in marble. A considerable portion of the church is attributable to Bramante, and with some reason. The basement of rich mouldings is surmounted by a band of large medallions, above which is a series of rectangular recesses, some of them used as windows, the others intended to be filled with decorations. The pedestaled pilasters on the mullions dividing the openings alternate with intermediate baluster shafts over the centers of the spaces below, an arrangement that is typically Bramantean. The dome is similar in some ways to that at



The Palazzo del Consiglio, a work by Fra Giocondo, at Verona. It differs from the Florentine loggia in the free use of the arabesque pilaster.

the Certosa, and is much less heroic than that of Brunelleschi's at Florence. In the interior is seen that favorite device of the architect—two concentric archivolts at some distance from each other, united by a series of circles filling the space between them. Como presents a modified version of this same design.

The sacristy of S. Maria presso San Satiro

is also by Bramante, and the church itself is partly his work. An extraordinary feature of the church itself, which was begun in 1477, is the treatment of the chancel. Owing to the rearrangement of the streets skirting the structure, the architect found, after completing the nave, that he had no room for the usual chancel. He solved the difficulty by constructing in low relief a chancel

with the ornament and decoration in perspective. Seen from the middle of the nave, the effect is passable; seen from other points, it becomes an absurdity. The sacristy itself is octagonal with semi-circular niches, but because of the height, in order to secure the appearance of rigidity and unity he was compelled to resort to the use of single pilasters bent to the wall angles, instead of pairs of pilasters, as in S. Spirito. The panels of these are filled with carved ornaments. Moreover, he breaks back the entablature over the pilasters, which masterly touch gives force and strength to the angles. The frieze that divides the upper and lower stories was the work of Caradosso and is not the least striking portion of the interior.

To Bramante and his followers Rodari, Solari and other "masters," are due the works at Pavia, Brescia and other northern towns of Italy, executed in the last part of the fifteenth and the first part of the sixteenth centuries. These men were good builders, but they were faced with the problem of working out the details of a style for which they were not trained, a style that differed from that of their fathers. Their work lacks repose, but there is much about

it that is admirable. No one denies the beauty of the porch of S. Marie de' Miracoli on the Municipio at Brescia; or the façade of the Colleoni Chapel attached to the Church of S. Maria Maggiore at Bergamo; or the Palazzo del Consiglio at Verona. Certainly the Colleoni Chapel is as wonderful in color as it is in ornament. Its pink, white, red, black and gray marbles are mingled in elaborate profusion. In Fra Giacondo's Loggia at Verona the marble columns in front are alternately dark and pink, and the marbles of both colors are used also for the soffits of the arches and the architraves.

In Bologna the materials used were mostly brick, with stone for ground-floor stories. The palaces lacked that charm which marks the Renaissance buildings of Florence. The stones were shaped and worked and "worried" until they were just so, as if handled almost by jewelers. The façade of the Palazzo Bevilacqua illustrates this trait. The stones are exact squares and each is cut in facets. The windows are like those in northern towns, while the doubling of the bays of the arcade on the upper story in the courtyard was a favorite device of northern architects.



Frieze by Andrea della Robbia in the Ospedale del Ceppo at Pistoja.

A MARBLE STREET

An Odd Thoroughfare Traversed Daily by Thousands
of Baltimoreans

BEGINNING in 1898 in two rooms containing 800 feet of floor space, the Maryland Casualty Company, of Baltimore, has occupied five homes in the twenty-six years of its existence. Each change was due to increased business and, strangely enough, each time new quarters were secured, the Company felt that the space thus acquired was amply sufficient to care for many years of expansion. The growth was so rapid, however, as to outstrip the most optimistic dreams of the founders, and from a company having net premiums in 1898 of \$164,072 it has reached the point where thirty or forty millions of net premiums in a year is a normal business.

Only a year was spent in the original location. The first move was to the top floor of the Equitable Building in Baltimore, where 4,200 square feet were rented. By the time of the Baltimore fire in 1904, 2,200 additional square feet had been secured.

When the fire drove the Company from the Equitable Building, it located in an old residence on the outskirts of the business district, where 9,000 square feet of office space were available. From here the offices were transferred in 1905 to a new three-story structure built for its own use in the heart of the city's financial district at Baltimore Street and Guilford Avenue. Here 25,000 of the 33,000 square feet in the building were used by the Company.

In two years the necessity for an addition became apparent and in 1908 two stories were added, giving a total of 41,000 square feet. In 1910, so rapid was the expansion of the Maryland Casualty Company's busi-

ness, it was necessary to purchase the adjoining property, and on this arose an additional five-story building running from Baltimore Street to Fayette, with the large and attractive tower at the Baltimore Street end forming the dominant feature.

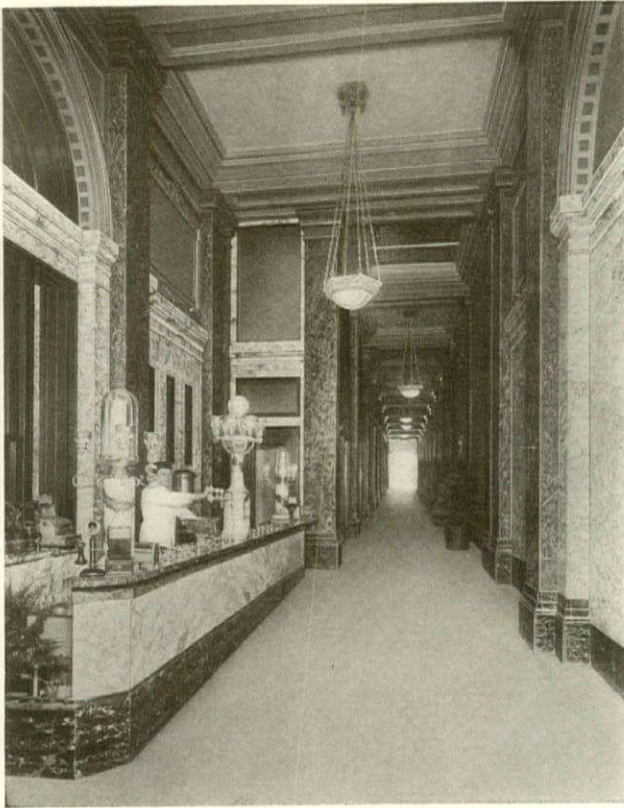
Here, it was felt, was a building giving all the necessary facilities in the way of working space for indefinite future growth. But the old story was to be repeated—and the former crowded conditions soon existed. The Company was again compelled to seek more room. The number of employees was then about 1,000. This time it was decided to provide an area sufficient for unlimited expansion. A tract of twenty-five acres in the northern suburbs of Baltimore was purchased. Beside the need for room, it was the desire of the Company to minister to the welfare, comfort and convenience of its employees in the largest possible measure, and this could be done vastly better in such a location than at the center of a congested business district.

The group of buildings erected furnish a total space of nearly 300,000 square feet with more than enough unoccupied land available to build a second group, when needed, as extensive as the present one.

The Hearst Tower Building, as the old down-town home of the Maryland Casualty Company is now called, is today one of the distinctive landmarks of Baltimore. Its tower, the highest observatory point in the city, rises to a point 341 feet above the street level. This is surmounted by a powerful beacon light visible for a distance of twenty-five miles, and above that is the



The "Maryland Casualty Tower" Building, now known as the Hearst Tower Building, through whose center runs the marble street. From an old illustration.



The Arcade, looking toward Fayette Street.

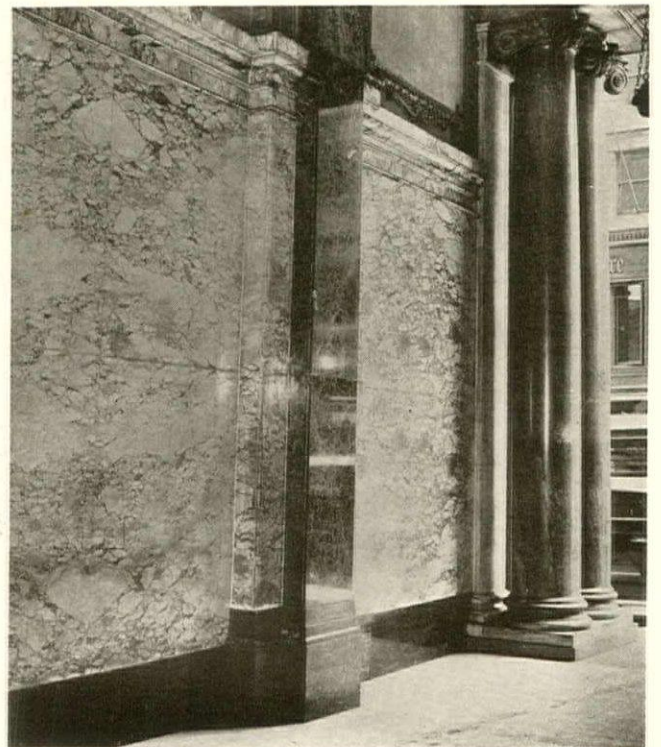
United States Time Ball equipment. The tower contains a 17-foot four-dial clock, a familiar friend to most Baltimoreans. There is another feature beside the tower, however, which distinguishes the building. On the ground floor, running through from Baltimore to Fayette Streets, is a thoroughfare for pedestrians, an arcade that is built almost entirely of marble, and that is probably the only covered marble street of its kind in the world.

The entrance at Baltimore Street has marble monoliths with carved capitals. The walls are wainscoted in Breche Opal marble with pilasters of Verde Antique marble extending to the ceiling. The floor is of Tennessee, and though millions of feet have trod these marble tiles during the past twelve years, there is no sign

of wear. Opening onto this corridor are stores on both sides, shops that in most cases have no outlet except upon this marble street and whose whole subsistence is dependent upon the throng passing through its splendid length.

A stroll through the corridor reveals some curious markings in the veinings of the wall marbles. In one design there is a well-defined bust of a bearded sentinel in armor. The helmet and breastplate, beard and mustache are clearly shown. The eyes are two dark spots that give the figure a stern aspect, and make him resemble the warden of a mediaeval castle. In other panels are dogs' heads, an owl, a huge sunfish and even a "Gibson Girl."

The elevator lobby to the west of the corridor, on the Baltimore Street front, is finished in marbles rich in color and carefully selected. The matching of the Breche



Baltimore Street Entrance to the Arcade.



The Main Elevator Lobby, with its marble treatment of Breche Opal and Verde Antique. The bases are Black and Gold.

Opal in the walls is excellently done, while the heavy-appearing columns of Verde Antique strike an unusual note in marble treatment. Black and Gold marble was used as a wall base, while the Breche Opal, which comes from Seravezza, Italy, was used to panel the elevator openings, and in the counters of the cigar stand in one corner of the lobby.

The floor is of Tennessee with insets of Marvilla marble, while all the upper floors through the building as well as the corridors and toilet rooms are of marble from Tennessee.

The architect for the tower was Otto G.

Simonson, of Baltimore, and the plans for the new group of buildings now occupied by the Maryland Casualty Company were also from his office. This group consists of five units, of which the most important are the Administration Building and the Club House. The former, which houses the executive and clerical staff of the Company, dominates the group. It is built in the modern classic style and is 320 feet long and 260 feet deep, made up of three buildings combined into one, forming the letter H. The main entrance leads into a monumental rotunda which is a focal point from which the other portions of the building are reached.



View of Arcade, looking south toward the Baltimore Street entrance. The floors, pilasters and part of the walls are marble.

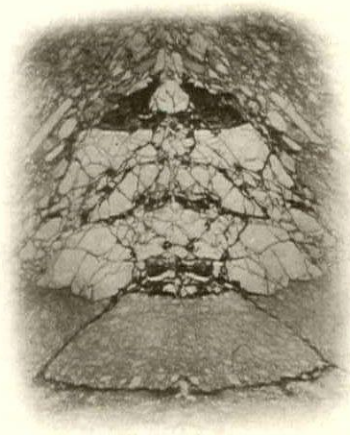
The floor of this rotunda is several steps lower than the main first floor. This difference in height acts as a base for the octagonal shaped structure from the four smaller sides of which a dome rises on pendentives at the third floor line and terminates in a band of bronze forming the collar of a leaded glass skylight, also domical in shape. The four larger sides of the octagon which are on the two main axes of the building are made up of large marble Ionic columns, between the Caen stone pilasters supporting the cornice and arches above. Between the arches are the pendentives on the four smaller sides. The entire rotunda, except the marble base, pedestal and the marble columns and bases and bronze caps, is of Caen stone.

Around the rotunda on each floor runs a

corridor which connects the three main divisions of the building.

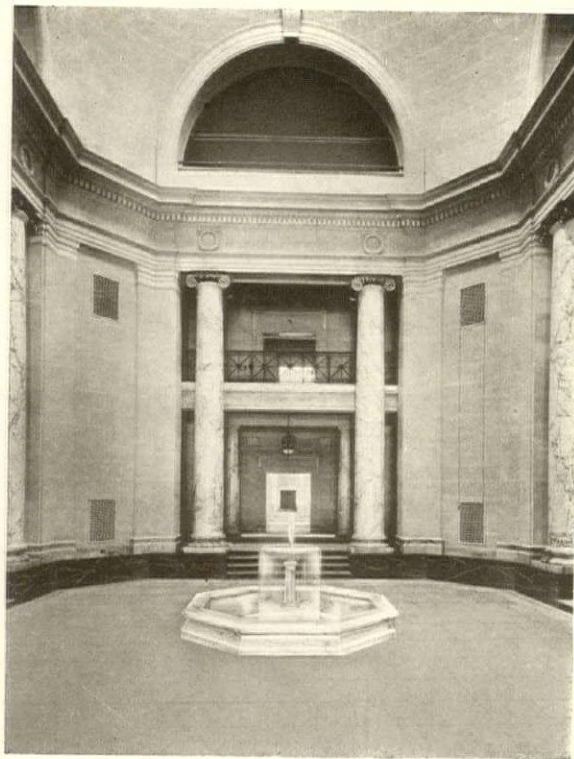
On entering the building, immediately to either side is seen a marble stairway that leads right and left to the basement, where locker and toilet rooms for the employees are located. This stairway continues upwards from each side of the entrance to the two upper floors. In the center of the rotunda floor is an octagon-shaped marble fountain surmounting a carved marble bowl. The marble at the base is Verde Antique. The column and pilaster bases, as well as the columns, are of American Pavonazzo. The stair risers and treads are of Tennessee marble.

The Club House, nearly 300 feet long, provides recreation rooms, dining-rooms, smoking-rooms and, as its chief feature, an auditorium with a seating capacity of 1,500. It is designed to give the best sight lines and perfect acoustics. The distance from the curtain line of the stage to the rear line of the seats is only 85 feet, while the width of the room is nearly as great—78 feet. This arrangement brings the audience close to the stage. The floor is properly pitched and bowled. Spacious aisles and exits are provided and the public sacred



The Sentinel, one of the many figures shown in the wall panels.

THROUGH THE AGES



Rotunda in the Administration Building, one of the new Maryland Casualty Group.

concerts held here on Sunday afternoons during the winter have proved extraordinarily popular with the people of Baltimore. It also contains an Austin organ and moving picture room. Other buildings in the group consist of a large printing plant, a three-story garage containing over 13,000 square feet of floor space, and the power house.

Terraces, flower beds, trees, shrubbery and walks form a park about the group, while south of the Club House are tennis courts and a baseball diamond. Underground concrete tunnels that carry the steam, water and gas pipes and electric cables, are built to permit workmen to walk through for inspection and repairs.



The new home of the Maryland Casualty Company, Baltimore, Maryland.

THE SENATE OFFICE BUILDING

A Mass of Marble that Cost Nearly
Five Million Dollars

ABOUT a year after Congress had authorized the construction of the House Office Building in Washington to meet the needs of the representatives, provision was made for a similar structure to be used by the members of the United States Senate. A committee appointed by Congress, consisting of Senators Cullum, Gallinger and Teller, immediately began the initial steps that have resulted in the magnificent Senate Office Building just northeast of the Capitol.

The site chosen was technically known as Square No. 686, which included the block bounded by B Street, Delaware Avenue, First Street and C Street, Northeast. The building occupies three sides of the square, the First Street side remaining open, while there is a set-back on B Street and Delaware Avenue from the curb of about 55 feet, the space thus gained being embellished with the necessary terraces to give the building the proper architectural setting.

Enumerating dull data of dimensions and figures of cost is apt to prove a stupid business, but in no other way can a proper idea of this particular structure be gained than by the recital of some of its measurements and the money spent in its erection.

The north and south dimension of the open court is 294 feet and the perimeter or combined frontage of its three sides is 884 feet, the total perimeter of the street and court façades being 2,341 feet, or nearly one-half mile.

In conformity with the Capitol Building, the principal (B Street) front of the Senate Office Building shows three stories above the ground. The grade falls away from

B Street toward the north, and the north front on C Street has all five stories above ground. Above the cellar is a floor available for offices or folding rooms, or both, and above that are the three stories devoted to the uses of the Members of the Senate.

The architectural treatment of the B Street, Delaware Avenue and C Street fronts of the Senate Office Building is identical with the treatment of the corresponding fronts of the House Office Building. At the corner of B Street and Delaware Avenue the highest point of the building (the top of the balustrade over the main cornice) is 77 feet above the curb and 93 feet above the level of the cellar floor.

The design is modified classic, the somewhat stern lines of the Doric style of the Romans having been thought eminently suitable for such a building, especially in view of the fact that marble was to be used altogether for the exterior. The consulting architect, John M. Carrere, of New York, kept constantly in mind the close relationship that the structure would have to the Capitol Building, and the plans were intentionally simple, omitting pediments, domes or other strongly accented architectural features.

Structurally, the Senate Office Building is of the "masonry" type, with walls faced with marble, backed with brick, and floors that are carried on steel beams which span from the outer stone-faced walls to the inner brick corridor walls. Between the beams is the concrete floor construction.

The B Street colonnade, facing the Capitol grounds, is 292 feet 7½ inches long. It



Gallery on the second floor of Rotunda, in the Senate Office Building,
Washington, D.C.



Exterior of Senate Office Building, showing Front Entrance on B Street.

contains thirty-four columns, each 29 feet high. Elsewhere on the building are thirty-four other columns of the same size, making a total of sixty-eight. These columns all rest on plinths built up to a height equal to the cap rails of the balconies placed at the level of the second-story floor. The entrance at B Street and Delaware Avenue does not differ materially from the main entrance of the House Building. A large circular head window, flanked by free standing columns, is the chief adornment. Similar windows in the upper part of the corner pavilion, with pilasters and columns moulded to conform with this central window, continue the general theme. None of the third-story windows show on this elevation, this space being treated with an ornamental sunk panel,

carved at the top. Beneath each of these panels is a window on the level beneath with an ornamental moulded pediment cap. This pediment rests on richly carved corbels. The vertical lines of the windows have moulded architraves and lines of carved mouldings.

The marble used in the main fronts is from Vermont, the contract price for the material being \$910,000—the total appropriations towards the construction and completion of the building were:

For acquisition of site, \$746,111. For construction of building, including special foundation work on First Street required by the proximity of the Pennsylvania Railroad tunnel, \$3,594,761. For all furnishings, \$300,500. For approaches, \$123,000.

Since the building contains approximately



View of Main Stairway.

7,000,000 cubic feet, the cost was about fifty cents per cubic foot, a figure that compares very favorably with the cost of most representative type of commercial office buildings in the largest cities. The increased cost over the House Office Building has been expended principally on the portions of the structure to which the public has access. This increase was comparatively slight and yet the difference in the degrees of impressiveness exhibited by the two buildings is overwhelmingly in favor of the Senate Building.

This is accounted for by the fact that the largest part of this extra cost is due to the interior marble work in the rotunda, the main stair hall, the conference rooms, the various committee rooms, the staircases and corridors. It is an admirable example of the economy of marble, since unquestionably such a contrast between the two buildings so notably in favor of the Senate Building could not have been secured with so small a difference in cost had any other material been employed.

The rotunda, main stair hall and conference room are at the B Street and Delaware Avenue corner of the building, and correspond in location to the same features in the House Office Building. They all differ from the latter, however, in architectural treatment and in the materials used in their construction and finish.

The rotunda is 57 feet 4 inches in diameter on the center line of the column and 75 feet 6 inches in diameter on the enclosing wall. It contains eighteen free standing marble columns, each 24 feet 6 inches high. The columns rest on a marble arcade and are surmounted by Corinthian capitals. Above these is a coffered dome. The rotunda extends entirely through the building from the street floor to the roof and its total height is 68 feet. The effect of the gleaming marbles gathered together in such a splendid architectural design is one of noble solemnity. The perfect balance of the

parts, the impeccability of the proportions, the implication of permanence, suggested by the coldness of the stone, evoke a sentiment of dignity without pomp, of strength without undue severity. The chaste simplicity of the wall lines is somewhat relieved by the marble floor with its central inset of concentric circles and its border of strips of the darker colored marbles.

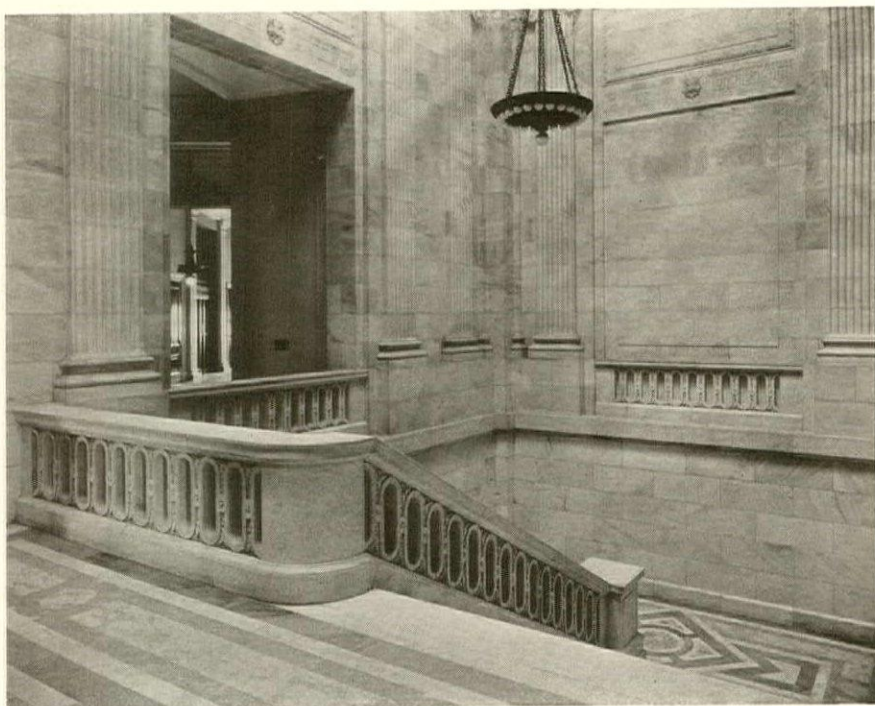
The conference room, on the floor above the street level, opens on the Main stair hall on one side, and faces the court on the other. This room is intended for conferences, caucuses, public hearings and for similar purposes. Here was held recently the investigation of "Teapot Dome" and the oil scandal. It is 52 feet by 74 feet in size and will comfortably seat 300 persons. The walls and floor of the conference room are of marble. This room has an especially elaborate character due, in part, to the style of decorations used, and partly to the fact that it contains twelve Corinthian columns spaced along its side walls, six on each side, each column 27 feet 6 inches in height. In addition, there are pilasters placed similarly at each end. The ceiling is coffered and decorated with rosettes and panels of carving. Chandeliers of intricate pattern are suspended from the ceiling and the capitals of columns and pilasters are handsomely carved. The effect of magnificence from so much decoration is tempered by the naked marble of the walls and floors, so that no feeling of extravagance or pompousness

or over-luxuriousness is experienced.

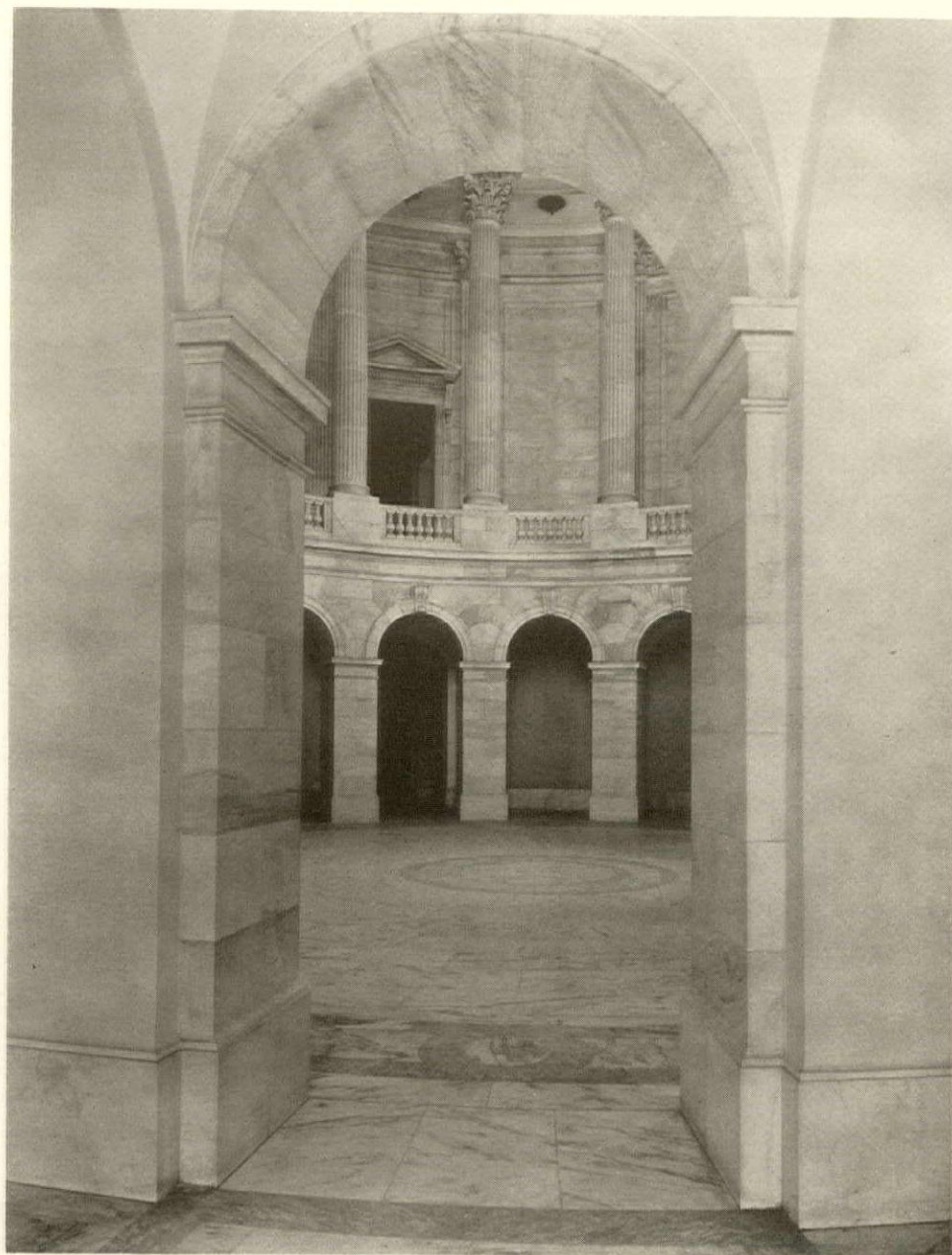
All of these marbles, both interior and exterior, were the product of American quarries. The walls of the rotunda and the main stair hall were made from the product of the Beaver Dam quarries in Maryland. The marble for the interior floors, pilasters in the committee rooms and in several of the other rooms was from Vermont, chiefly from the quarries at Rutland and Florence. The same state supplied the marble for the terraces, while from New York's South Dover quarries came the marble for the conference room.

The Senate Building contains, besides the conference room, eight committee rooms, two of which are 30 by 65 feet wide and extend through the two stories, with vaulted elliptical ceilings. The six others are each 25 by 50 feet. All of these rooms are finished with marble pilasters, marble mantelpieces and marble floors.

The dining-room, at the corner of Dela-



Upper Landing of Grand Stairway.



View of Rotunda and Arcade

ware Avenue and C Street, is the same size as the two-storied committee room immediately above, and the marble treatment is likewise similar.

The great bulk of the inside area is taken up by senatorial offices. These are arranged on each floor in a double row separated by a corridor about 12 feet wide. One row of

rooms faces on the street, while the other opens on the court. The offices are arranged in suites of two or more rooms generally, though there are a few single offices. On the three upper floors there are four office suites of three rooms, ninety-four suites of two rooms and ten single rooms.

Each of the two-room suites consists of a

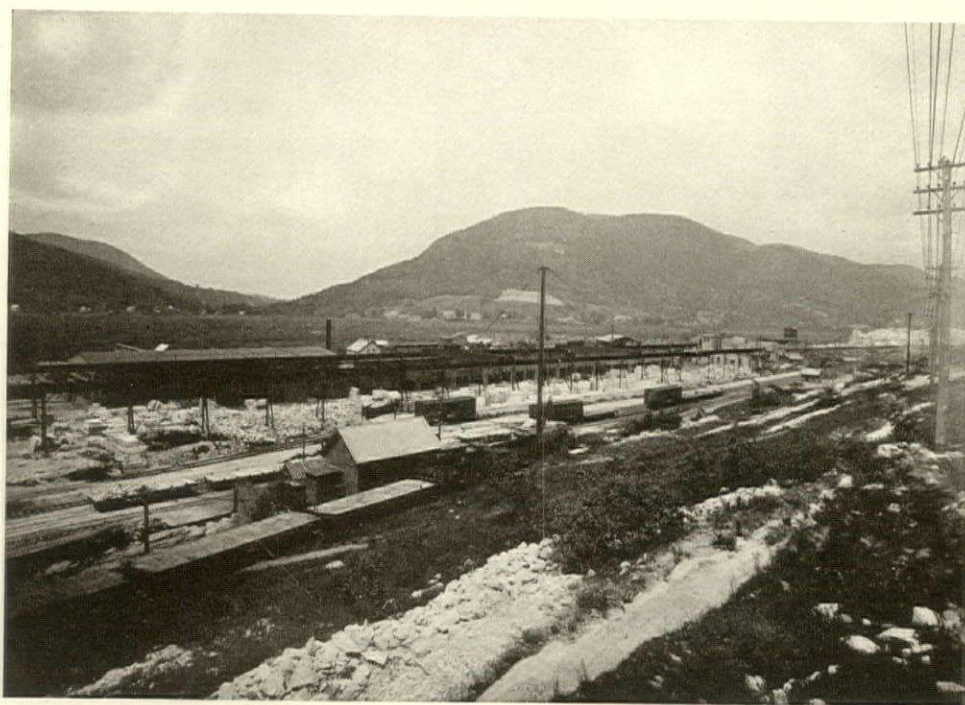
private office for a Senator, with an adjoining office for his secretary. The average size of these rooms is about 16 by 25 feet for the former and 12 by 25 feet for the latter. In each office is a marble mantelpiece and a floor border of marble. The furniture is all mahogany and some idea of the stupendous task of equipping this building may be gained when we consider that over \$300,000 was spent for furnishings generally. While the sum may seem large, we must not overlook such equally striking figures as these: there is a total of 25 miles of piping in the building, and 50 miles of electric wire, and over 30 miles of electric conduit; there

are 639 interior doors and 114 toilet rooms in the three upper floors.

A feature of unusual interest is the method arranged for the rapid transportation of the Senators from the Office Building to the Capitol. Under the rotunda and extending through both the cellar story and the story above it is a large vaulted room which is, practically, the terminus of a subway running from the B Street and Delaware corner of the building to the northeast corner of the Senate wing of the Capitol Building. This subway is equipped with automobiles for the convenience of the members of the Senate who have offices in the new building.



The Conference or Caucus Room in the Senate Building, where the "Teapot Dome" investigations were held recently.



General view of a plant at West Rutland, Vermont, as it looks from the hillside back of the quarries.

THE OLD AND NEW IN MARBLE QUARRYING

ON a certain June day in the year 1884, the little town of Middlebury in the Vermont mountains was trying to honor its famous sons. A new town hall had been built, and a tablet was to be placed therein, bearing the names of the favored few. A committee was holding an open session in the old court house, that each worthy citizen might have the privilege of lauding his own particular hero.

Among other names brought forward was that of Isaac E. Markam. It was claimed that early in the century he had invented the method of sawing marble that is still in use—smooth iron bands, set in a frame, fed by sand and water, and moved to and fro across the marble by power-driven machinery. Older residents could remember how he had worked out the plan and how

the first mill had been built in Middlebury under the patronage of Dr. E. W. Judd.

The evidence was more or less convincing, but the committee decided to make further research. As the investigation trailed back into history, it was discovered that Pliny described the same system of marble sawing, as being in operation in the year 250 B.C. It was learned further that similar mills driven by water power were established in Germany in the fourth century of the Christian era, and that Leonardo da Vinci, the versatile genius of the Middle Ages, had complete data on the process in his note books. It was decreed, therefore, that the late Mr. Markam was not entitled to recognition in the Middlebury Hall of Fame.

It seems almost incredible, yet it is undeniably true, that the world today is saw-

Illustrations courtesy Vermont Marble Company



Looking up toward the sky in a quarry in Vermont. This section of the deposit is no longer being worked.

ing marble in substantially the same way that it was being sawed twenty-five centuries ago. Even here in America, in this age of ingenuity and industrial development, we are still relying on iron bands and sand and water for the greater part of our sawing. True, we have improved the mechanical appliances, steel has taken the place of wood; electric power has crowded out the clumsy old water wheel. After all, though, the principle is still the same.

While it is undeniably true that we have evolved nothing radically new in certain lines of marble working, we have at the same time brought to other departments of the industry methods that are distinctively American. In no field perhaps has the ad-

vance been more notable than in those gigantic holes in the ground known as marble quarries. And back of all this, acting as a spur to the imagination and a goad to dormant mechanics, stands an unfailing heritage of Yankee thrift.

The first native marble used in this country was not taken from quarries; it was split from exposed ledges. Without these ledges, the pioneers would never have guessed the riddle of the marble beds. In following them down into the ground, they unwittingly opened the door to a vast treasure house, and it was the effort to conserve that treasure which led to improved means of detaching the stone from its ancient bed.

First, the quarry owners experimented with powder and fuse, the useful aids both then and now of European operators. With each succeeding blast, however, the vision of waste became more obnoxious. For every sound slab they carried away they were obliged to leave behind a new pile of shattered, useless stock.

Finally, as a matter of pure economy, they resorted to the slower and more laborious method of hand-channeling.

Under this system, the men were arranged in rows, each with a chisel-pointed tool of tempered steel, each delegated to cut a small section of the long groove which was to liberate the sides of the blocks. It was slow, painfully slow. There was no end of backache and perspiration. But in the judgment of the owners the saving in marble more than made up for the increase in labor, and so the innovation was given right of way, and the orders for powder went into a decline.

So far as we of today may know, the directors of the industry were satisfied with

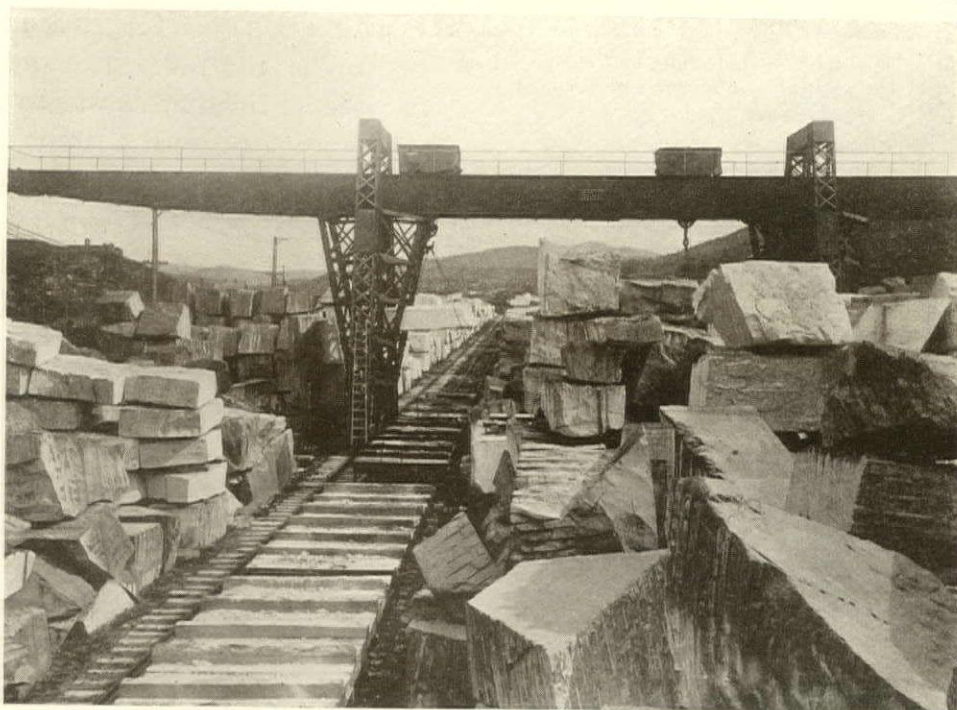
this cumbersome way of working, this game of putting brawn against the unyielding foundations of the mountains. The records point to only one man who was entirely out of sympathy with prevailing conditions. In watching the small army of men, whose usefulness in the scheme was limited to mere mechanical pounding, he began to wonder why a machine could not be made to take the place of the human hands. Out of his dreams and his models grew a steam channeler—a clumsy affair yet a prodigious step ahead of everything that had preceded it. This machine, named the Wardwell Channeler in honor of its inventor, was given its initial run in the old Sutherland Falls Quarry in what is now the village of Proctor.

It was in 1863 that the old double-lever Wardwell Channeler was introduced. The mechanism was comparatively simple. The chisels, which prior to that time had been run singly by man power, were clamped together, a limited number in each frame, and

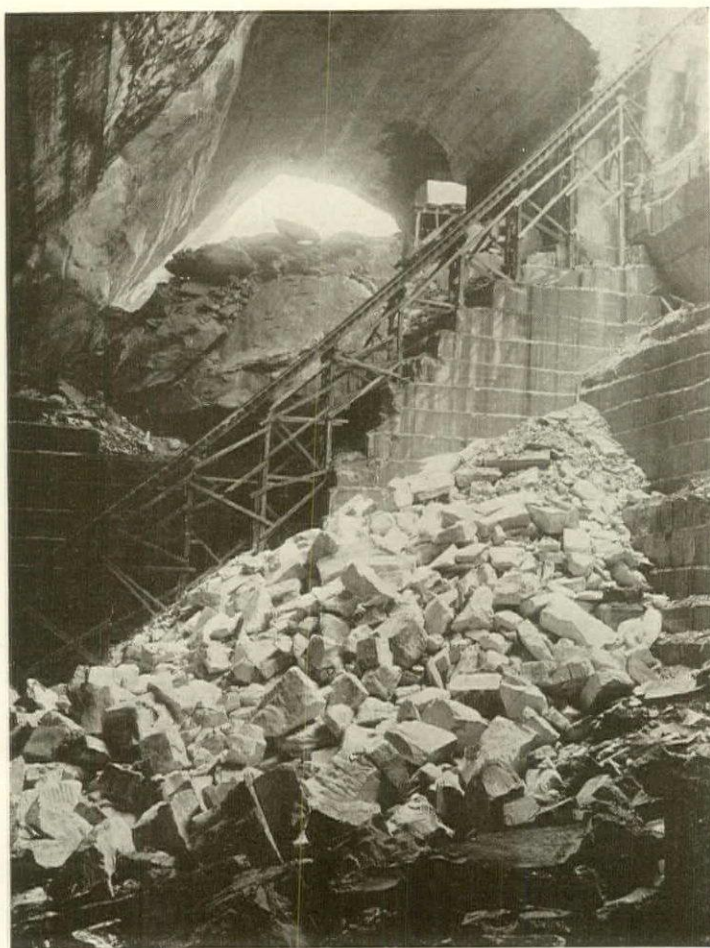
made to attack the marble by steam power. Each outfit had its own boiler, and, as it moved to and fro over the floor of the quarry on a movable section of track, it kept up a ceaseless hammering, and set a pace which no line of human channelers could ever hope to equal.

Once the idea was made common property and its practical value demonstrated, men began to come forward with improvements. New appliances were grafted to the original frame. The boiler was taken off the car and the steam piped from a larger boiler which stood outside the quarry.

Later, after some years of partial success with the diamond drill, a steam channeler was perfected which would run on an inclined floor. Still later, electric power was introduced in many quarries, thus doing away finally with the objectionable clouds of smoke and steam, and freeing the quarries from the handicap of leaking pipes. All this has been often retold and warrants no



Corner of a marble storage yard in Vermont, where about 12,000 blocks from the quarries are piled.



Section of the inclined cable road over which blocks are raised from one of the underground quarries in Vermont.

long description. It has been brought into this sketch merely as a little reminder of the progress that has been made and of the effort to eliminate waste, which in reality is only another name for progress.

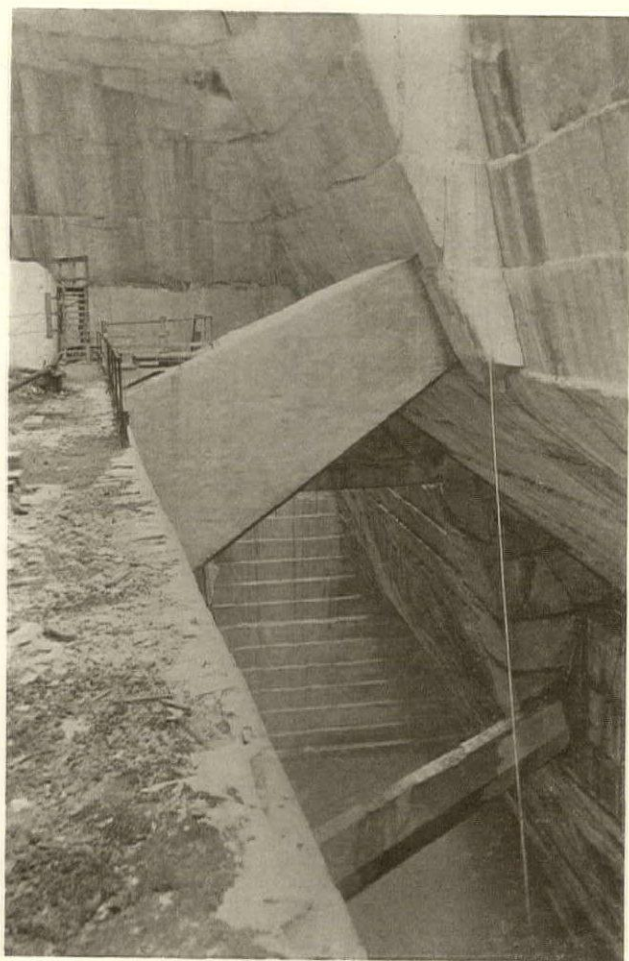
Even now, when marble quarrying as it is carried on in America is less wasteful than at any time in the history of the world, the operators are constantly searching for new ways to save stock. The problem is most complicated perhaps in the quarries of Vermont. There, owing to the unusual position of the marble beds, the original openings are somewhat like the shafts in a mine; they merely lead down to the tunnels which have become the active producing centers.

Visitors who have inspected the vast underground recesses of the West Rutland quarries, almost invariably have the feeling that they have seen the inside of a mine. And so they have if one may hold literally to the language of the dictionary. The great excavation at West Rutland started as a quarry, but it outgrew its name, a result which was all unforeseen by the pioneers who started blasting there on the hillside a little less than a century ago.

For a time it was open quarrying. The vein as it led down from the surface at a slight incline was only about 50 feet thick. Its length and width were unknown. After a period of years, when the channeling machines had reached a depth of approximately 200 feet, it was discovered that through one of those inexplicable twists of nature, the vein had been turned abruptly back under the hill. The only way to secure the marble was to follow the vein. And so the tunneling began.

Today that stretch of tunnel has a length of 2,000 feet. It is hundreds of feet wide and interlaced with lines of electric car track. Its mighty roof is supported by gigantic marble piers, which have been left intact while the blocks around them have been cut away. Here and there, in the impenetrable gloom of its deepest levels, are clusters of blinking lights, indicating that the work of expansion is still going on. They are still following the vein. When and where it will end is a question that is causing no present anxiety.

In opening these new tunnels, there are two possible ways of clearing the space between the roof and the first floor, a space in which a man may stand without endanger-



The trail of the channeling machines. The ridges on the walls of the quarry indicate the successive layers of blocks that have been removed.

ing his head. Here again the decision hinges on the old question of economy.

If it is determined that the upper layer of stone under the new roof is of doubtful quality, the vigorous method of drilling and blasting may be employed. If, on the other hand, the stock is so valuable as to more than equalize the gain in time, that initial mass of stone is removed block by block by the channelers and drills, for in these days the channelers, with the improved radialax drill mounting, can be made to work in places which were once beyond reach.

The outsider no doubt is more impressed by the blasting method. He hears the shouts of the workmen far out in some dimly lighted tunnel, and then a sound like the beating of a mammoth drum, a sound that rebounds from side to side of the vast subterranean passages. It is all very picturesque—much more thrilling than the dull rhythmic beat of the channeler. The operator, however, thinks nothing of this. He has seen it too often. He favors blasting as a time-saver, but he never allows it to interfere with the larger business of saving marble.

The same principle governs the opening of a quarry. After the coating of dirt has been cleared away, the amount of blasting to be done is always in direct proportion to the amount of worthless stock that lies near the surface. Sometimes, it is deemed advisable to build trestles of wood and start the machines on the highest of the uncovered shelves. Even though the first blocks may be of questionable grade and soundness, the courses under them may have value, provided they are not subjected to the shock of an overhead explosion.

The basic idea then back of the marble industry is not so very different from those on which many other American industries have been built. Speed in production is essential, but it may be completely wrecked on an overloaded waste pile. In the early days of America, it was enough to get the marble. Today, notwithstanding the great advance in output, there is far less of recklessness in cutting into the mountains. Efficiency and economy have been made to travel hand in hand, and by that means has the industry been given a fairly safe guaranty of permanent stability.

A LIST OF THE WORLD'S MARBLES

By J. J. McClymont

Note—In a past issue, Mr. McClymont proposed, for the sake of convenience, to divide the different marbles into four groups. These arbitrary groupings were as follows:

GROUP A—Any marble or stone sold to the trade in fair-sized slabs or blocks of commercial size, rectangular shape and guaranteed by the seller to be sound, free from natural defects, that can be finished at a minimum cost, and sold to the consumer as sound marble.

GROUP B—Any marble or stone sold to the trade in slabs or blocks of fair or medium size, generally rectangular shape, guaranteed to be sound and free from natural defects, the finishing of which, because of texture, the size of slabs, the shape and size of blocks, is somewhat more expensive than those in Group A.

GROUP C—Any marble or stone that cannot be sold as sound but contains a minimum amount of natural defects, such as dry seams, old fractures, partially or completely healed surface voids, etc., to be treated by the manufacturer in the most approved manner, reinforced where necessary by liners on back or metal inlays and sold to the consumer as semi-sound marble.

GROUP D—All marble, stone and so-called serpentine marbles, and Onyx, which, by their peculiar formation are known to be fragile, such as Breccias and nearly all highly colored marbles and serpentines, and that are sold to the trade in irregular shaped blocks or slabs without a guarantee as to their soundness, treated by the manufacturer in the most approved manner, reinforced where necessary by liners on back or metal inlays and sold to the consumer as unsound marble.

Georgia Mezzotint—Group A.

Quarry at Tate, Pickens County, Georgia.
Dove gray with bluish wavering clouds.
Takes high polish.

Georgia Pink—Same as Etowah.

Georgia Serpentine—See Georgia Green.

Georgia Silver Gray—Group A.

Quarry at Tate, Pickens County, Georgia.
Uniform color of soft silver gray.
Takes high polish.

Georgia Verde Antique—See Georgia Green.

Georgia White—See Amicalola and Kenesaw.

Quarry at Tate, Pickens County, Georgia.
Is almost pure white with light-bluish tints or markings.
Takes high polish.

Germany Marbles—See marbles of Bavaria, Nassau, Saxony and Westphalia.

Gesualdo Onyx

Found at Gesualdo (Principato Utteriore) near the Central Chain of the Southern Apennines, Italy.

This is a cave Onyx for which we find no description, but is of interest because of the fact that from this locality Architect Vanvitelli furnished thirty-two Onyx

Monolithic Columns for the Royal Palace of Caserta. (Merrill)

Gew Graze Quarries—See Cornish Serpentine from the Gew Graze and the Pengersick Quarries.

G. Green—(Very similar to Verdura)—Group B.

Eastman's Quarry, West Rutland, Vermont.

Light green to light greenish-white.
Takes medium polish.

Gheradesca

Quarried at Gheradesca, near Florence, Tuscany.

White, violet and flesh colored mottling. (Blagrove)

Giaccione Alabastro—Same as Alabastro A Giaccione.

Giaccione Rossastro Alabastro—Same as Alabastro A Giaccione Rossastro.

Giallastro Nuvolato Alabastro—Same as Alabastro Giallastro Nuvolato.

Giallicco—Yellowish.

Giallio—Yellow.

Giallo Antico or *Giallo Antique*, Ancient name for Numidian Yellow. Some writers have confused this marble with Siena Old Convent, which was unknown to the ancient Romans; while the general color is similar, the purple veins of the Old Convent are large and flowing and it is without fine veins.

According to Pullen this name was restricted to a variety which he describes as a pale yellow, flushed with deeper yellow, and finely veined with purple, while other varieties of the same marble but slightly different in color were known by the following names:

Giallo Alabastrino—Same, with patches of Alabaster.

Giallo Bigiastro—Same, veined with gray.

Giallo Brecciato—Same, with reddish-brown clay and white and yellow pebbles.

Giallo Brecciato Bruno—Same, with brown pebbles on whitish yellow.

Giallo Brecciato Dorato—Same, gilded pebbles, in a paste of purplish-red.

Giallo Brecciato Pallido—Same, yellowish-brown, with pebbles of pale rosy white.

Giallo Brecciato Pallido Rossastro—Same, pale yellow, with pinkish-brown pebbles.

Giallo Brecciato Principe—Same, pure violet ground, spotted with white and pebbles of bright creamy yellow or shattered gold on purple or orange pebbles on red.

Giallo Carnagione—Same, flesh color and pink, stained with dusty brownish yellow.

Giallo Carnagione Disfatto—Same, fleshy red, broken and crushed.

Giallo Carnagione Tigrato—Same, stains of fleshy red, untidely surrounded by grayish-white.

Giallo di Siena—Same as Siena Yellow Galena.

Giallo di Siena Brecciato—Quarried near Montarenti, Tuscany, Italy. Brown and white with yellow stones.

Giallo di Siena Dorato—Same as Siena Yellow Galena.

Giallo di Siena E Nero—Same as Siena Brocattello with more black veins.

Giallo di Siena Venato—Same as Siena Brocattello.

Giallo Dorato Tigrato—Same, gilded yellow, with purplish veins.

Giallo Dorato Cupo Tigrato—Same, dark gilded yellow.

Giallo Dorato Piritifero Tigrato—Same, gold and rose, with black spots showing crystals of sulphate of iron.

Giallo E Nero Antico or *Marmor Rhodium*—An ancient marble from the Island of Rhodes. Black veined with golden yellow.

Giallo E Nero di Porto Venere (Black and Gold)—See Portor.

Giallo Fasciato Tigrato—Same, yellow banded with white.

Giallo Focato Tigrato—Same, uniform pink, crossed by the action of fire.

Giallo Mello Tigrato—Same, honey colored yellow, with large stains of light gray and similar ones of white.

Giallo Nuvolate Tigrato—Same, white plentifully clouded with light yellowish-brown in parallel curves.

Giallo Paglino Tigrato—Same, uniform straw color.

Giallo Pallido Tigrato—Same, cream colored, streaked with rose or chocolate and spotted with bluish-gray.

Giallo Picchiettato Tigrato—Same, pale and golden yellow, minutely punctured or lichenized with brown.

Giallo Rossastro Tigrato—Same, purplish yellow.

- Giallo Sfrangiato Tigrato*—Same, yellow and light brown, disposed in lumps like raw silk.
- Giallo Solforato*—Same, uniform bright sulphur color.
- Giallo Venato*—Same, yellow veined with white.
- Giallo Tigrato*—Same as Marmor Corinthium.
- Giallo Tigrato Pallido*—Same as the pale variety of Marmor Corinthium.
- Giallo Avorio*—Same as Numidian Yellow.
- Giallo Brecciato*
Quarried near the Banks of the Arno, Italy.
Varying shades of yellow. (Blagrove)
As Miss Porter mentions an ancient *Giallo Brecciato* as having been found at Chemton (Ancient Simitto Colonia), in the valley of the Medjerde, Tunis, Africa, and as this is where, according to Playfair and other authorities, *Giallo Antico* was found, it is possible that both are ancient names for Numidian Yellow.
- Giallo Canarino* or *Giallo Carnagione* (flesh-colored yellow)
Roman names for Numidian Yellow.
- Giallo Con Frappo di Arno*
Quarry near the banks of the Arno, Italy.
Yellow with large bands of deeper yellow (Blagrove)
- Giallo di Mori*—Group C.
Mori Quarries in the Commune of Mori, Tyrol, Austria.
Bright orange yellow with light and dark sinuous veinings and having a few small white patches. (Watson)
- Giallognolo*
Ancient name for Parian Marble with yellowish cast.
- Giallo Liniato di Arno*
Quarry near the banks of the Arno, Tuscany, Italy.
Yellow with fine bands of deeper yellow. (Blagrove)
- Giallo Linato di Mugnione*
Quarried near Mugnione, Tuscany, Italy.
Yellow mingled with red with veins of brownish shade. (Blagrove)
- Giallo Paonazzo*—Same as Numidian Pavo-nazzo.
- Giallo Verona*—See Yellow Verona.
- Gibraltar Stone* or *Gibraltar Onyx*.
A stalacite or cave Onyx.
Quarry at Stalacite Caves, of St. Michael, Gibraltar.
Brown and amber with veins or varying shade. (Watson)
Generally used for trinkets.
- Giglio Granite*—See Granito di Giglio.
- Gila Quarries*—See Ricolite. On the Gila River.
- Gioja Quarries of Italy*
According to Merrill the marble from this quarry "is fine grained, and uniformly white and somewhat translucent."
- Gippsland*—See Buchan, Buchan Gray, Buchan Gray and Fawn, Orbost and Toongabbie.
- Girolomo* or *Istrian Stone*
Quarry in Istria, Italy.
Light fawn with darker veins and yellow mottlings. (Watson)
Takes medium polish.
- Givet*—Same as Rouge de Givet.
- Gjelleboek*
Quarried in Norway.
Gray with rather unusual tinge of green and brown veins.
Takes high polish.

Glageon or Lumachelle

Quarried at Glageon in Nord, France.
Blackish-gray with small gray fossils.
(Blagrove)

Glamorganshire Alabaster—See Welsh Alabaster.

Glen Falls Black

Quarry at Glen Falls, New York.
Jet black with few faint hair lines.
Takes high polish.

Gloucestershire—See Cotham.

Glu—Lime.

Godfrey Quarries

Near Friedsville, Blount County, Tennessee.
Produced Champion Pink, Holston Pink and Roseal.

Goldedar

Daniel Quarries at Nehden, Westphalia, Germany.
Deep black with well-defined white veins.
(Watson)

Golden Breccia—Group D.

Quarries at Castle Island, near Tralee, County Kerry, Ireland.
Light pink and deep red mottles with white dots and spots. (Watson)

Golden Gray—Group A.

Gray Knox Quarry, near Knoxville, Tennessee.
Dark pinkish-gray with crow feet markings of brownish-blue.

Golden Onyx—See Onyx Dore Passe.

Stalagmite du Bedat is also called Golden Onyx.

Golden Vein Colorado Yule—See Colorado Yule Golden Vein.

Golzennes Quarries

Black Belgium marble (Noir Belge) is quarried near this place.

Good Castol Quarries—See Cornish Serpentine.

Goonhilly Downs—On Goonhilly Downs one of the Cornish Serpentine is quarried.

Gora Quarries—See Sabalgarh.

Gorlinger Quarries—See Sussex.

Gortan-Corna Quarries—See Ballachulish.

Gosobor

An extravagantly described brand of Tennessee Pink Marble.
No longer available.

Gougnies Quarries—See St. Anne.

Gouverneur Marble

Name given to marbles quarried near Gouverneur, New York.
Various colors.
Used for monumental work.

Gragnano Marbles

Quarried near Gragnano, Campania, Italy.
Small bluish-white fragments cemented closely by a chalk red cement. (Merrill)

Gramat

Gramat Quarries in Lot, France.
Yellow with irregular brownish markings. (Blagrove)

Grand Antique

Modern name for Nero Antico or Noir Antique, one of the ancient marbles of unknown origin.

Grand Antique (Ariege)—Group C

Castelnau Quarries, Aubert, Ariege, France.
Black with white fragments apparently brecciated but fairly sound.
Takes good polish.
The Romans are supposed to have opened these quarries originally and later abandoned them. They were reopened during the middle of the eighteenth century.

LIST OF QUARRIES AND MARBLE MANUFACTURERS

REPRESENTED IN THE MEMBERSHIP OF THE
NATIONAL ASSOCIATION OF MARBLE DEALERS

<i>City and State</i>	<i>Company</i>	<i>Representative</i>
Akron, Ohio.	Flower Marble and Tile Company	Jas. T. Flower
Atlanta, Ga.	Reeves Marble Company	Alex. Reeves
Baltimore, Md.	Hilgartner Marble Company	A. H. Hilgartner
Baltimore, Md.	Jos. B. Dunn & Sons, Inc.	Chas. Scheidt
Baltimore, Md.	P. B. and W. Marble and Tile Co., Inc.	Richard T. Salter
Birmingham, Ala.	Alabama Marble Company	John S. Sewell
Boston, Mass.	Troy Bros. & Company	M. W. O'Brien
Buffalo, N.Y.	Geo. W. Maltby & Son Company	Wm. C. Maltby
Buffalo, N.Y.	Lautz Marble Corporation	R. K. Glass
Carthage, Mo.	Arnosti Marble Co.	A. Arnosti
Carthage, Mo.	Carthage Marble and White Lime Co.	Geo. S. Beimdiek
Carthage, Mo.	Consolidated Marble and Stone Co.	Millard Bryan
Carthage, Mo.	Ozark Quarries Co.	T. R. Givens
Carthage, Mo.	F. W. Steadley & Company, Inc.	K. D. Steadley
Carthage, Mo.	Lautz Missouri Marble Company	John E. O'Keefe
Carthage, Mo.	Spring River Stone Company	T. J. Murphy
Chicago, Ill.	American Marble Mill Company	J. J. Bauer
Chicago, Ill.	Black & Gold Marble Company	C. N. Marthens
Chicago, Ill.	C. N. Marthens Marble Company	B. F. Meservey
Chicago, Ill.	Corley-Meservey Marble Company	Humbert Davia
Chicago, Ill.	Davia Bros. Marble Company	Thos. A. Knudson
Chicago, Ill.	Enterprise Marble Company	F. A. Flavin
Chicago, Ill.	Flavin Marble Mill	Frank P. Bauer
Chicago, Ill.	Frank P. Bauer Marble Company	K. H. Townsend
Chicago, Ill.	Henry Marble Company	Jos. Little, Jr.
Chicago, Ill.	Jas. B. Clow & Sons Company	Thos. F. Keating
Chicago, Ill.	M. Keating & Sons Company	Thos. Naughton
Chicago, Ill.	Naughton Marble Company	Frank J. Peerling
Chicago, Ill.	Peerling Marble Company	C. R. Borchardt
Chicago, Ill.	Standard Mosaic Tile Company	Geo. W. Bower
Chicago, Ill.	Taylor Marble Company	George Wilde
Cicero, Ill.	National Mosaic Tile Company	H. L. Pike
Cincinnati, Ohio	Cincinnati Marble Company	R. M. Allen
Cleveland, Ohio	Allen Marble Company	W. J. Haworth
Cleveland, Ohio	Empire Marble Company	E. M. Fritz
Cleveland, Ohio	Haworth Marble Company	S. J. Weingarten
Cleveland, Ohio	Interior Marble and Stone Co.	L. G. Yeau
Cleveland, Ohio	Prospect Marble and Tile Company	C. F. Wege
Cleveland, Ohio	Roy-Cliff Marble Company	J. C. Bruggen
Columbus, Ohio	Wege Marble and Tile Company	J. Desco
Dallas, Texas	J. Desco & Son	William Jessop
Dallas, Texas	Southwest Marble Company	D. C. McElhinney
Dallas, Texas	McElhinney Tile and Marble Co.	W. D. Watson
Denver, Col.	Denver Mantel and Tile Company	J. R. Golden
Denver, Col.	Des Moines Marble and Mantel Co.	H. F. McAdow
Des Moines, Iowa	Holbrook Marble and Tile Company	E. L. Leavenworth
Des Moines, Iowa	Christa-Batchelder Marble Co.	B. L. Cummins
Detroit, Mich.	Detroit Marble Company	

THROUGH THE AGES

<i>City and State</i>	<i>Company</i>	<i>Representative</i>
East Cambridge, Mass.	Johnson Marble Company	T. J. Johnson
Fort Worth, Texas	Good Marble Company	H. G. Good
Houston, Texas	Salt Lake Marble and Supply Co.	Geo. E. Rieder
Indianapolis, Ind.	F. E. Gates Marble and Tile Co.	F. E. Gates
Kansas City, Mo.	Kansas City Marble and Tile Co.	G. F. Keller
Kansas City, Mo.	Phenix Marble Company	Mastin Simpson
Kansas City, Mo.	Sutermeister Stone Company	C. O. Sutermeister
Kasota, Minn.	Babcock & Willcox	Tyrell S. Willcox
Kasota, Minn.	Breen Stone and Marble Co.	Tyrell S. Willcox
Knoxville, Tenn.	Candoro Marble Company	Craig C. Day
Knoxville, Tenn.	Gray Eagle Marble Company	E. F. Klein
Knoxville, Tenn.	Gray Knox Marble Company	J. B. Jones
Knoxville, Tenn.	John J. Craig Company	John J. Craig
Knoxville, Tenn.	Knoxville Marble Co.	John M. Ross
Knoxville, Tenn.	Ross & Republic Marble Co.	W. E. Moses
Knoxville, Tenn.	Salomone-O'Brien Marble Company	Walter O'Brien
Knoxville, Tenn.	Tennessee Producers Marble Co.	B. L. Pease
Little Rock, Ark.	Southwestern Tile Company	R. E. Overman
Long Island City, N.Y.	Clarendon Marble Company	Alexander Thomson
Louisville, Ky.	Peter & Burghard Stone Co.	Jos. E. Burghard
Memphis, Tenn.	Central Mosaic and Tile Co.	Louis B. Marus
Milwaukee, Wis.	Andres Stone and Marble Company	Edgar Andres
Milwaukee, Wis.	Breidster Marble Company	Fred. W. Breidster
Milwaukee, Wis.	McClymont Marble Company	J. J. McClymont
Minneapolis, Minn.	Twin City Tile and Marble Co.	F. O. Streed
Minneapolis, Minn.	Northwestern Marble and Tile Co.	Chas. Gramling
New Orleans, La.	Albert Weiblen Marble and Granite Co.	Albert Weiblen
Oklahoma City, Okla.	Taylor Marble and Tile Company	G. W. Taylor
Omaha, Neb.	Sunderland Bros. Company	J. P. Williams
Peoria, Ill.	Peoria Stone and Marble Works	H. A. Farley
Pittsburgh, Pa.	American Marble Company	Max Weiner
Pittsburgh, Pa.	Iron City Marble Company	George L. Sibel
Pittsburgh, Pa.	Pennsylvania Marble and Mosaic Co.	John A. Fiore
Somerville, Mass.	Phil. H. Butler & Son Company	P. H. Butler
St. Louis, Mo.	Bradbury Marble Company	I. P. Morton
St. Louis, Mo.	Pickel Marble and Granite Co.	H. A. Feldman
St. Louis, Mo.	St. Louis Marble and Tile Co.	R. C. McDonald
St. Louis, Mo.	Shaw Marble and Tile Company	A. Coerver
St. Louis, Mo.	Union Marble and Tile Company	W. C. Fox
St. Louis, Mo.	Weis & Jennett Marble Company	Joseph Weis
St. Paul, Minn.	Drake Marble and Tile Company	W. E. Andrews
Tate, Ga.	Georgia Marble Company	Sam Tate
Wichita, Kan.	Hawkins Marble and Tile Company	M. K. Hawkins
Wilmington, Del.	Geo. W. McCaulley & Sons, Inc.	C. W. McCaulley
Winchester, Mass.	Puffer Mfg. Company	A. W. Puffer

CO-OPERATING—

Vermont Marble Company, Proctor, Vermont.



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All the marbles for this installation were furnished by the Candoro Marble Co. The bank fixtures were by the Georgia Show Case Co., Montgomery, Ala., who design, manufacture and install such fixtures.

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