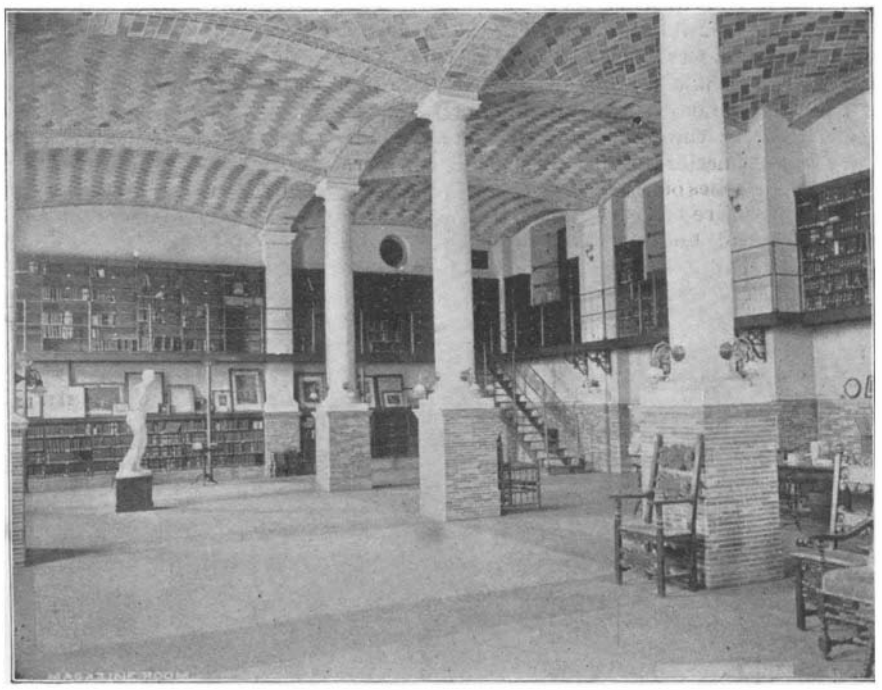
THE BOSTON PUBLIC LIBRARY.

To the stranger sojourning a few days in Boston a strong consciousness of the civic and urban pride of the inhabitants early presents itself. A quiet pride in their city seems to be a characteristic of all the inhabitants. No institution of the city has been a juster object of such pride than the famous Boston Library, which for many years dispensed its literary hospitality from the old building on Boylston Street, as well as from numerous branch libraries in Charlestown and elsewhere. On December 1, 1894, there were 608,466 volumes in the Library. In 1892, 25,000 new books were added, so that, at this rate of increase, but sixteen years will elapse before the round million is reached. It is told of the public library in Berlin that it was moved from one building to another in a day, an entire regiment of soldiers being detailed for the task. When the Boston Library trustees determined to erect a new building, and after such building was completed, five weeks to a day were occupied in the transfer of the contents, and during that period there was hardly a break in the work of all the departments. We illustrate the new building in the present issue with reference to its structural and technical features, as well as from the art aspect. It fronts on Copley Square, directly opposite Old Trinity. Its architects were the New York firm of McKim, Meade & White, identified with so many of the most beautiful buildings of this country; in this city notably the Madison Square Garden and the Washington Arch.



THE PERIODICAL ROOM.

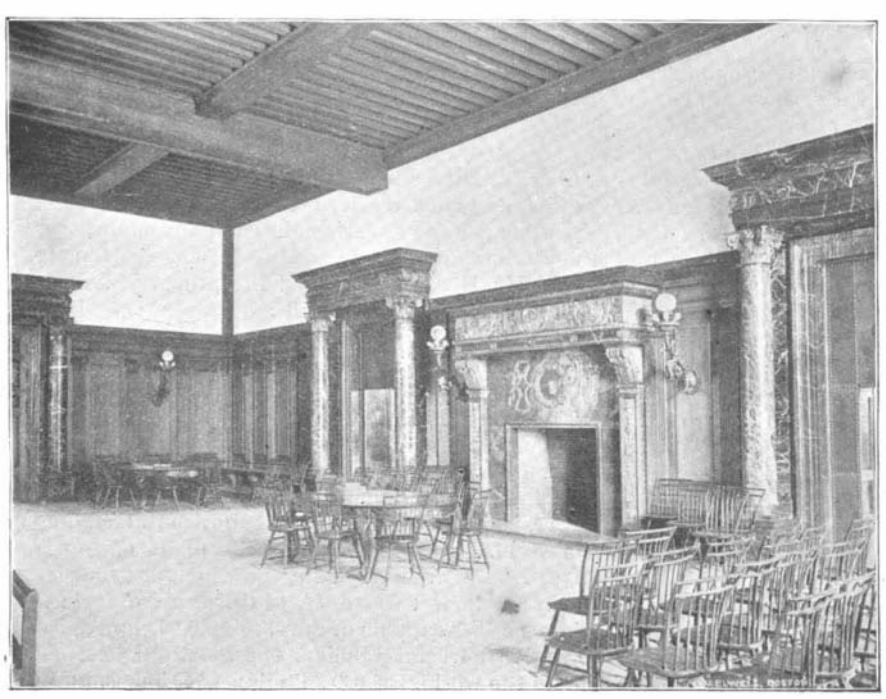
The building, in the Renaissance style, is, to a certain extent, based upon the Bibliotheque St. Geneviève, Paris. In the string course under the lower windows, in the more massive columns of the upper arcades, and in the somewhat severer character of its architecture, variations on the prototype are found which distinguish one from the other. The use of a typical horizontal style of architecture in Copley Square was dictated by several considerations. Any approach to the perpendicular style would have seemed to involve competition with existing structures, and the great area devoted to books demanded a serious treatment. The front is of Milford granite, grayish white in color with pink spots. The tablets which close a portion of the arches of the arcade are inscribed with the names of great artists, writers and scientists, comprising a very long roll of honor, four names being accidentally duplicated. In the spandrels between the arches are thirty-three medallions carved in granite, mostly copies of the trade marks of early printers. Various inscriptions are placed over the entrances.

The building is 225 feet long, 227 feet deep, and its cornice is 70 feet above the sidewalk. The great central reading room runs across the entire front of the building and is 218 feet long and 42½ feet wide and 50 feet high. This is furnished with tables and chairs for readers, who also have free access to a special collection of books in open cases in the hall, from whence they may be taken without appeal to any attendant. At the end of the room is the great card catalogue, a really monumental example of library work, contained in the most approved cases, while numerous tables and seats of special design are placed within the semicircle of card cases, in order that the readers may consult the index in comfort. In this main reading room, termed Bates Hall, those who desire books from the main collection enter the name and designation of the book desired on a slip on which they also write the number of their table. The slip is handed to the attendant, and in a few minutes the book is brought to the reader at his table. Immediately back of Bates Hall is a great quadrangle or open court, surrounded by a very beautiful arcade of columns, with a fountain in the center, which court it is proposed to have opened to the public, to whom it will afford a delightful retreat and may serve as a species of outdoor reading place.

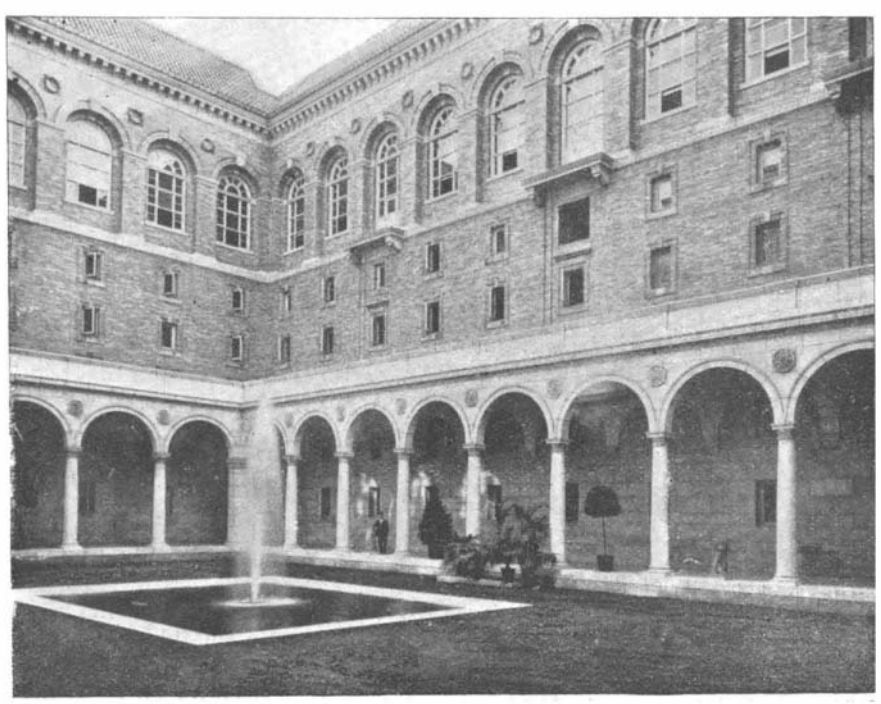
The interior court, with its graceful loggia surrounding it, and its central square basin and fountain, forms a cloister in the heart of the library. The walls of the buildings are of yellow brick and Medford granite. The arcaded colonnade or loggia runs around three sides of the court, the wall of the grand staircase projecting from the fourth side.

The portion of the building which lies between this courtyard and Copley Square is devoted to the administrative officers of the library, to Bates Hall, and to certain special collections of books and relics. The stack rooms with their book stacks occupy the buildings on the other sides of the central court, and it is here that the most impressive part of the library is found. Instead of high stories with tall book stacks rising from floor to ceiling, we find the great building divided into six stories by low ceilings and occupied by interminable lengths of simple pine book shelves on which the books are stacked. Leaving the Bates Hall with its high arched roof, leaving behind the magnificent marble and brass work and structures of the main entrance and passing into the stack rooms, the contrast is startling, it seeming almost like a visit to the catacombs. The book shelves are painted white, the ceilings are white, pendent incandescent lights are extended by long flexible cords to the place where required, and here and there at intervals are seen the attendants waiting to distribute the books. The vast

SCENE IN STACK ROOMS, SHOWING BOOK DELIVERY RAILWAY AND VIEW OF THE INNER COURT.



THE DELIVERY ROOM.



THE CENTRAL COURT, COLONNADE, AND FOUNTAIN.

THE BOSTON PUBLIC LIBRARY.

ness of this department may be realized from the fact that the books now on the shelves occupy from 80,000 to 100,000 feet of shelf room, which is from 12 to 15 miles, and a quantity of shelf room is still unoccupied. For, without disturbing its present plan, about 2,000,000 volumes, or three times the present number, can be accommodated. Simply to walk the length represented by the occupied shelves would take a good pedestrian four hours.

It is evident that the problem of the distribution of the books to the reader was a difficult one, and it was solved by the use of pneumatic tubes and a very perfect cable railroad driven by electricity. The six floors of the stack building are traversed by a cable road on the order of the familiar cash railroad used in large stores, and pneumatic tubes are carried to all parts of the building. When a book is called for, the slip is placed in a cylindrical box and is sent through the tube to the stack room. Here it is received by the proper attendant, who, taking the book from the shelves, places it in a little car, and starts the car on its journey. Constantly moving cables are caught by the car grip, and quickly draw the car from the stack rooms directly to the distributing desk, if on the same floor, and if not to elevators, which automatically transfer it to the delivery room floor, where the book is received by attendants at the desk and handed to the applicant. Books are returned to the stack room by the same method.

The system is illustrated in detail in the illustrations, among which a sectional view of a portion of the building is given, to show the whole plant at a glance. Each of the six stack floors is traversed by a cable road of eight inch gage. The cables are kept in motion by an electric motor in the basement of the building. The delivery room, where all the books are sent and whence they are redistributed, is approximately on the level of the fourth stack floor. From this floor the cable road runs directly to the delivery room. For the other floors elevators are provided, working in a shaft which is shown in the sectional view already alluded to. The book cars are automatically transferred from railway to elevator, and are raised or lowered as required for sending to their proper destination.

The cable works in a vertical plane, the upper element running from the delivery room to the stacks, and the lower element in the reverse direction. Two tracks, one vertically over the other, run throughout the stack rooms, and the end view of the brackets carrying them is shown in the cut. When a car is sent from the delivery room to the stacks it traverses the upper track, and near the end of its course has its grip automatically tripped. Running on by inertia, it has its course gradually checked, and stops upon the transfer table shown in Fig. 1 of the small cut of the transfer table and pneumatic tube connection. The table descends automatically to the level of the lower track, and stops there, and the car stays upon a switch on the lower level. When books are to be sent to the delivery desk, they are put into the car, the attendant pushes it off, and as it leaves the switch and reaches the main track, the grip seizes the cable and the car starts off on its long voyage, stopping finally in the delivery room. To check it as it enters the elevators, and to check the too rapid descent of the transfer table, buffers, counterweights, and retarding apparatus are provided. In the cut of the transfer table, the pneumatic buffer and the counterweight are seen beneath the table.

Fig. 2 of the same cut shows the pneumatic tube terminal connections. Orders for books are sent by these tubes to the stack rooms. A receptacle for the boxes is placed directly beneath the opening of the tubes. As the box, after traversing the tube, is expelled from its end, it is projected into this receptacle, strikes a strap, and rings a bell, notifying the attendant of its arrival. The connections are shown in section. The large illustration shows the lines of tube traversing the building, all centering in the delivery room; the ends can be seen behind the delivery desk.

The delivery room is the link connecting the public portions of the library with the secluded stack rooms, and is the most sumptuous room in the building. Here the public apply for books, and one of our illustrations shows the main room, while the portion behind the delivery desk, where the lines of railway, elevators, and pneumatic tubes have their terminus, is shown in another view. The room has a wainscot about 11 feet high, of light colored oak, the ceiling is painted in dark blue and purple; the doorways and mantel piece are in highly colored marble, and the floor is covered with tiles of Istrian and Verona marble. The room is 64 feet long and 33 feet wide. The paintings of the Quest of the Holy Grail, by Edwin A. Abbey, decorate the space above the wainscot.

The periodical room is characterized by its low arched construction of ceiling, carried by a number of columns. More than 200 newspapers are received and at the disposal of the public. The room was originally intended as a lecture hall, but the offer of Mr. William C. Todd, of New Hampshire, to give $2,000 per annum and to endow it in his will to that extent for the purchase of newspapers caused the abandonment of the lecture room project.

We have spoken already of the great card catalogue. The problem of managing it has become so vast that it is now proposed to print the titles for the cards, using machines of the linotype class, so as to obtain the titles in solid slugs or lines. These slugs will then be utilized for printing the card catalogue and will be preserved so as to be applicable for printing special book catalogues if desired. The production of a complete book catalogue is practically impossible. It was estimated a few years ago, when the collection was smaller than it now is, that, with the maximum of compression, involving the use of small type and a quarto size of volume, 17 volumes of 650 pages each would be required for the catalogue. All work in the shape of catalogues other than the card catalogue will probably take the shape of special publications in special lines of work. The cost of the building and its equipment is placed at $2,368,000.

Inventions in Glass.

A Washington correspondent, in his rambles through the Patent Office, discovered some curious inventions in glass, which he communicated to the Philadelphia Times.

Among these is a glass coffin, which is guaranteed proof against decay and rats. So long as no deliberate attempt is made to smash it, it ought to last forever. Another contrivance is a staircase made wholly of glass, steps, landings and newel post being all of that material. Yet another is a glass barrel. But, perhaps, the most remarkable invention of the glass man is a billiard table of glass.

The day may yet arrive when people will live in glass houses. A patent has been secured by another inventor for glass bricks of a peculiar pattern. The material of which they are composed being a first rate non-conductor, these bricks will keep the cold out of a dwelling built of them, while admitting the light. It is claimed they will exclude noise, being hollow. Furthermore, the inmates of a glass house need not be afraid of being under too close observation by neighbors, inasmuch that it is not requisite that the bricks shall be transparent. They may be of opaque ground glass or of any color that may be suitable for decorative effect.

Thus, before many years have passed, it may be considered the height of luxury to occupy a dwelling of glass. Glass bricks, of course, are expensive. People who live in glass houses will be able to afford to wear clothes of glass. That sounds like nonsense, but the fact is that beautiful and most delicate fabrics are made out of spun glass. Nearly twenty years ago there was shown at the Centennial Exposition, in Philadelphia, a bonnet composed entirely of glass. It was a love of a bonnet. The flowers on it were glass, and so were the ribbons, which looked like the finest satin. The patentee of this process describes it as suitable for the manufacture of neckties, shawls, table covers, etc.

In fabrics of this kind a very fine quality of glass is used. It is spun in threads of exceeding delicacy, and of these several colors may be produced at the same time. They are woven in a loom of ordinary pattern. Anybody may observe that a thin sheet of glass is somewhat elastic. The threads employed in weaving are of such fineness as to be perfectly pliable and not at all brittle. With a gown of glass would naturally go a pair of glass slippers.

A Pittsburg man named Smith has invented a process for making glass slippers in moulds. They would not do very well for dancing. There is no reason why a glass gown should not be woven of iridescent glass, so that the wearer would look like an animated rainbow on a ball room floor—one dazzling shimmer of ever-changing hues. Until recently the manufacture of iridescent glass was set down in the list of the lost arts. But in 1878 it was rediscovered, and now it is a common commercial article. It is made by exposing the melted glass to the vapors of salts of sodium. At the Metropolitan Museum of Art, in New York City, are exhibited great numbers of bottles, plates and other articles of glass which were made and used long before Christ was born. They were dug up in Cyprus and elsewhere. Many of them have a beautiful iridescence, but it is the result of decay. Glass will rot like anything else, and decay has split the structure of this ancient glass into laminæ, or flakes, which interrupt the light so as to produce brilliant red, green, purple and other rainbow colors.

The window blinds of the glass house of the future will be of glass, of course. That is another patent, and the inventor suggests that such blinds may be made of whatever colors are desired. Baby in the nursery, perhaps, will play with glass building blocks and at a suitable age he will receive a Christmas gift of a pair of roller skates with glass rollers. Both of these ideas have been patented. When he is old enough to go fishing, he will not dig worms in the garden, but will be provided with artificial bait in the shape of a hollow minnow of glass, coated on the inside partly with a solution of gold or silver and partly with a luminous paint.

Glass bedsteads may be proof against lightning and bugs, but it is hardly to be expected that glass houses should be free from mice. The inmates could hardly do better than employ glass traps for the capture of such vermin. The great advantage of the glass mousetrap, according to the statement of the inventor, is that "if one mouse enter the trap he may be seen by others who chance to go that way, and they will be inclined to join the one inside, especially when they observe that he is nibbling a choice morsel." Up to date the glass mousetrap has not made itself popular, notwithstanding the important arguments in its favor, and of most of the other devices described it is unfortunately true that they have not proved profitable to the persons who contrived them. This remark, however, by no means applies to the glass lemon squeezer, which is already a familiar household utensil. The inventor of it is said to have sold his rights for $50,000. One of the most remarkable inventions in glass, by the way, was that of a Venetian named Joquin, in 1656. He noticed that the scales of a fish called the bleak gave a milky hue to the water, and that glass beads dipped into such water looked like pearls when dry. Subsequently the idea was conceived of making hollow beads of glass and lining them with the peculiar substance from the scales of the fish, and it is in this way that the so-called Roman pearls are now manufactured. It is to this substance that the iridescence of the scales of many species of fishes is due.

The Water Trees of Australia.

Those who go out to grapple with the dangers, the hardships, and the mysteries of the Australian desert regions should, above all things, instruct themselves in bush lore. It has happened more than once that in these dread torrid wastes the body has been found, lying beneath a tree, of some poor wanderer who had died from the lack of water, even while there was within a few inches of him a plentiful supply.

In all the unwatered regions of Australia are to be found "water trees," trees which actually provide a supply of water to those who know where and how to look for it. The most reliable of the water trees are the water mallers, or group of trees, including the Eucalyptus microtheca, which form a part of the terrible maller scrub. Outside of these, the currajong, the desert oak, the blood wood, and several varieties of the acacia are water-bearing trees.

I shall not soon forget my first introduction to a water tree. I was in the northern territory of South Australia, and I was making my first journey through the desert in company with a friend who was a well-informed bushman. It was toward the end of the day, and as we had been detained for several hours owing to an accident, we had still fifteen miles to travel. The water bag had been drained hours before, and in that dreadful desert our sufferings had already become intolerable. Suddenly my friend plunged his spurs into his weary horse and dashed at full gallop toward a tree some fifty yards off, shouting to me to follow. Flinging himself from his saddle, he clawed with his fingers the sand at the base of the tree, and presently laid bare one of its spreading roots. This was torn from the earth to the length of about six feet, and breaking off a piece about a foot and a half long, my companion, signing me to follow his example, applied one end of the piece of root to his parched lips and elevated the other end. I followed suit, and to my indescribable joy a cool refreshing draught of water rewarded me. The one root amply sufficed for our wants. There was some ten or eleven left, enough to have satisfied a dozen thirsty men. Some of the water we drained into our water bags. It was clear and cool, but after standing for a few hours I noticed that it became discolored.—Introduction.

Another Great Mill in Fall River.

The Fall River Iron Works Company was chartered in 1824, and then received the right to make almost anything. For a long time the company manufactured the products of iron ore and made some cotton cloth When Mr. Borden purchased the property, he turned all the mills into cotton mills.

Work on Mill 4, which was recently dedicated, was begun on May 14, and it is expected that its machinery will be in full operation by New Year's. The mill is 372 feet long, 165 feet wide, and four stories high. It has a capacity of 80,000 spindles and has 2,388 looms. The motive power will be furnished by a triple expansion, tandem, compound Corliss engine of 3,000 horse power, said to be the largest horizontal engine in the world. With the new mill the plant of the Fall River Iron Works Company now includes four mills, having a floor surface of 840,000 square feet; four triple engines, capable of developing 9,000 horse power; forty-five horizontal boilers, the fourth highest chimney in the world, 265,000 spindles, 7,700 looms, and 377 cards. The capacity of plant will be 50,000 pieces of cloth a week, and 2,700 hands will be employed. This does not include the 750 employes in the print works.